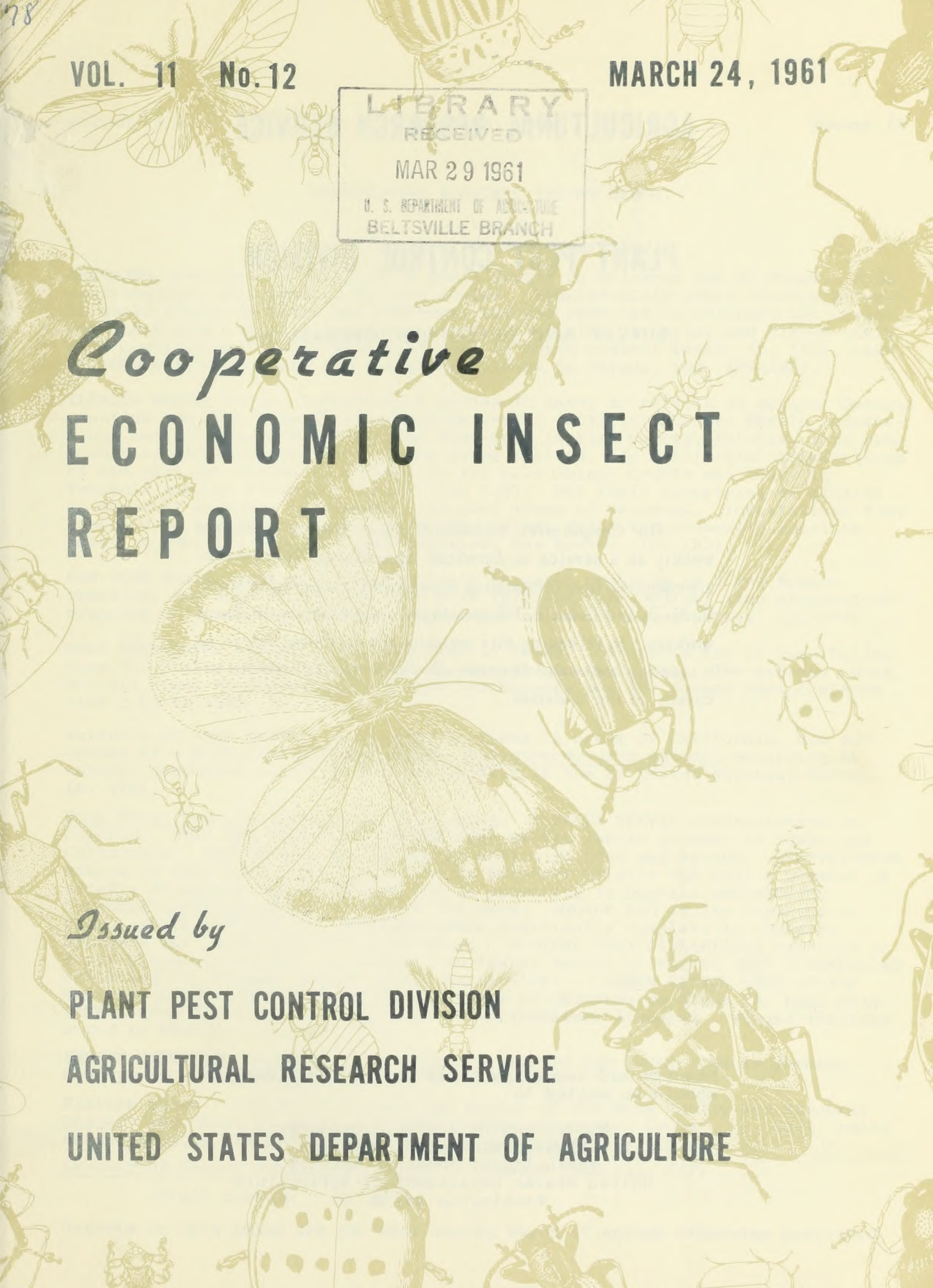
Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

78



VOL. 11 No. 12

MARCH 24, 1961

LIBRARY
RECEIVED
MAR 29 1961
U. S. DEPARTMENT OF AGRICULTURE
BELTSVILLE BRANCH

Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

Reports and inquiries pertaining to this release should be mailed to:

Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

Volume 11 March 24, 1961 Number 12

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

GREENBUG continues to build up in small grains in Oklahoma and in Texas. Some controls have been applied in both states. ENGLISH GRAIN APHID remains present in small grains in Texas and Oklahoma, and was reported in Colorado and Kansas. CORN LEAF APHID heavily infesting nearly all fields of barley and WINTER GRAIN MITE controls applied in many instances in north central Texas. (p. 191). ARMY CUTWORM active in Idaho and infesting alfalfa in Nevada. (pp. 191-192).

ALFALFA WEEVIL larval infestations medium to heavy in alfalfa in several Georgia counties and active in Virginia and Delaware. EGYPTIAN ALFALFA WEEVIL infestations continue heavy in alfalfa on Yuma-mesa in Yuma County, Arizona, with some second applications of insecticides being applied. In California, infestations of the pest are medium on alfalfa in San Luis Obispo County and heavy in Temecula area of Riverside County. (p. 192). PEA APHID increasing on alfalfa in areas of Arkansas and Kansas, and most areas of Oklahoma. Infestations also expected to become very heavy in north central Texas and presently continue heavy in Dona Ana and Roosevelt Counties, New Mexico. (p. 193).

SAN JOSE SCALE light to extremely heavy in apple orchards in 3 New Mexico counties; and eggs of a FRUIT TREE MITE (Bryobia rubrioculus) also abundant on branches of trees in many apple orchards in 4 New Mexico counties. (p. 194).

BEET LEAFHOPPER spring survey reported in Texas. Counts in the El Paso Valley were the highest that have ever been recorded in that area. The average count for all areas surveyed was 15.3 beet leafhoppers per 100 square feet compared with 3.95 in 1960. (p. 195).

Activity of BARK BEETLES increasing in pines in areas of California, and outbreaks of a PINE REPRODUCTION WEEVIL (Cylindrocopturus eatoni) occurring in natural ponderosa pine reproduction locally in the El Dorado National Forest. (p. 196).

Some First Reported Records of the Season: ALFALFA WEEVIL adults active in Colorado, Utah and Idaho; and CLOVER LEAF WEEVIL larvae present in Idaho and California. SWEETCLOVER WEEVIL adults active in Utah and Nevada. Overwintered adults of TARNISHED PLANT BUG active in Delaware alfalfa and adults present in alfalfa in Kansas. PLUM CURCULIO adults appearing in Georgia and SPOTTED CUCUMBER BEETLE becoming active in Delaware. SQUASH BUG adults reported in Utah. NANTUCKET PINE TIP MOTH emergence practically complete in southern Arkansas and pupae observed in Maryland. EASTERN TENT CATERPILLAR appeared in North Carolina on March 14, and second-instar larvae of FOREST TENT CATERPILLAR collected in Arkansas during period March 11-17. COMMON CATTLE GRUB adults noted in south central and southwest areas of Oklahoma on March 13. LONE STAR TICK adults first collected March 4 in northwestern Arkansas. Winged TERMITES noted in Wisconsin and Nevada.

INSECT DETECTION: Asiatic garden beetle reported for first time in Jackson County, North Carolina. (p. 194).

Picture sheet - "Means of Recognizing Larvae of Japanese Beetle and European Chafer" and "Rastrel Pattern of Some Common Scarabaeid Grubs". (p. 202). Adult description of Japanese Beetle and European Chafer. (p. 203).

Summary of Insect Conditions - 1960 (continued from page 187)

Fruit Insects - (p. 204).

Reports in this issue are for week ending March 17,unless otherwise indicated.

WEATHER BUREAU 30-DAY OUTLOOK

MID-MARCH TO MID-APRIL 1961

The Weather Bureau's 30-day outlook for the period mid-March to mid-April calls for temperatures to average above normal over the southern half of the Nation lying to the east of the Continental Divide, with warmest weather in the Gulf States and lower Mississippi Valley. Below-normal temperatures are predicted over the Far West, and also from the Western Great Lakes Region eastward to New England. In unspecified areas, near-normal average temperatures with large fluctuations are indicated. Precipitation is expected to exceed normal over most of the country, except for subnormal amounts over the Northern Plains and west Texas. Much of the precipitation over the southeast fourth of the Nation is expected to accompany squalls and thunderstorms.

Weather forecast given here is based on the official 30-day "Resume and Outlook', published twice a month by the Weather Bureau. You can subscribe through Superintendent of Documents, Washington 25, D. C. Price $4.80 a year, $2.40 a half year.

WEATHER OF THE WEEK ENDING MARCH 20

Numerous storm systems this week were responsible for widespread precipitation, considerable storminess, and a wide range of temperatures. Precipitation was needed in most of the Far West, kept soils too wet to work in the East and South, and prolonged the flood situation along many streams in the Midcontinent area. Precipitation in the Far West was generally moderate to heavy in Washington, northern Idaho, western Montana, western and northeastern Oregon;and the northern two-thirds of California and scattered, local areas elsewhere. East of the Continental Divide, precipitation was mostly moderate to heavy in the lower Great Plains and from the central and lower Mississippi Valley and lower Great Lakes region to the Atlantic coast. Weekly totals in the lower Mississippi Valley ranged up to 8 inches.

Much snow fell in the Great Plains and areas north of the Ohio River. Up to 5 inches of snow fell in the northwestern portions of Oklahoma on the 17th, and the northern portions again on the 19th and 20th. Heavy snow fell in New England during storms on the 14th, 15th and 19th and light amounts on the 16th were recorded in West Virginia. Most of New York State and New England are still covered with snow. Depths now range up to 30 or 40 inches in Aroostook County, Maine; 10 to 20 inches in central Maine and extreme northern Vermont and New Hampshire; 20 to 30 inches in northwestern Connecticut; and under 10 inches elsewhere in New England; with only 1 or 2 inches on the south coast. Much of central and northern New York State is covered by 6 to 18 inches.

Temperatures for the week averaged well below normal from the upper Mississippi Valley to the Atlantic coast even though the first part of the week was unseasonably mild. A cold air mass moved across the area the latter part of the period, and reduced temperatures to subzero levels in northern portions of New York State and New England on the 17th and 18th.

In most of the remainder of the Nation, temperatures averaged above normal, with greatest departures of 12° in the northwestern Great Plains. Extreme highs in the 60's and 70's were recorded in this area during the week. Winds up to 75 m.p.h. damaged farm buildings in northern Utah on the 18th. Hail, damaging winds, and a few tornadoes were recorded in central Texas on Thursday. In Louisiana, light hail damage occurred in many areas on the 17th, and on the same date a tornado caused heavy damage at De Quincy. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GREENBUG (Toxoptera graminum) - TEXAS - Infestations range light to heavy over panhandle and Red River areas; controls applied in many instances, but should be applied in many more. (Thomas). Light to moderate in many other fields in central and northern areas. (Newton). Counts ranged 25-150 per linear foot in Collin and Kaufman Counties. (Ridgway). Quite damaging in Potter, Gray, Carson, Randall, Swisher and Oldham Counties; 400-2,000 per linear foot in many fields; infestations spotted, not solid; only few greenbugs in some fields. Also damaging in Hardeman County. Considerable treatment being applied, with success. Some fields damaged in Armstrong, Deaf Smith and Donley Counties. (Daniels). Spot infestations appearing in many fields of small grain in north central area. Parasites present, but not too effective because of cool weather. Greenbug may be damaging if weather remains cold through April. (Chada). OKLAHOMA - Populations continued to build up in small grain in most areas. Infestations varied greatly from field to field (ranging very light to threatening) in southeast, south central, southwest, west central, central, north central and as far west as Major County in northwest area. Limited reports indicate populations apparently continued light in east central, northeast, extreme northwest and panhandle areas. Controls have been applied in some fields in all areas affected. (Okla. Coop. Sur.). KANSAS - Ranged 0-100 per 100 sweeps in fields of wheat and barley in southeast area; less than 10 percent winged forms. (Peters).

ENGLISH GRAIN APHID (Macrosiphum granarium) - COLORADO - Occasionally found on wheat in Baca County. (Colo. Ins. Sur.). TEXAS - Most numerous aphid in small grains in north central area. Not damaging at present, but when clusters appear on wheat heads, many reports of "greenbug" damage will be received. (Chada). OKLAHOMA - Continued common in small grain throughout most of State; probably the third most common aphid in small grain this week. (Okla. Coop. Sur.). KANSAS - Ranged 0-100 per 100 sweeps in wheat in southeast area, with less than 25 percent winged. (Peters).

CORN LEAF APHID (Rhopalosiphum maidis) - TEXAS - Ranged 100-200 per linear foot on barley in Collin and Kaufman Counties. (Ridgway). Practically every field of barley heavily infested in north central area. (Chada).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Common in small grains throughout State. Infestations ranged from 10 to several thousand per linear foot, with populations varying greatly from field to field within any given area. (Okla. Coop. Sur.).

APHIDS - ALABAMA - Unspecified species stunted oats in Irvington area of Mobile County on February 10; damage in area was extensive. (Seibels).

WINTER GRAIN MITE (Penthaleus major) - TEXAS - Light to moderate, widespread infestations attacking grasses, wheat and other small grains in panhandle, high plains and Red River areas; very little control being applied. (Thomas). Late infestations developing throughout north central area; many fields taking on silvery appearance; controls being applied in many instances. If weather remains cool during April, some severe damage may result. (Chada). OKLAHOMA - Light numbers present in many fields of small grain checked in western half of State. (Okla. Coop. Sur.).

BROWN WHEAT MITE (Petrobia latens) - COLORADO - Active on wheat in Baca County; 10-30 per foot of row. (Colo. Ins. Sur.). OKLAHOMA - Light numbers appearing in fields of small grain checked in western third of State. (Okla. Coop. Sur.).

ARMY CUTWORM (Chorizagrotis auxiliaris) - IDAHO - Early instar larvae range 2-20 per beet in small field of beets left in ground over winter in Canyon County. (Scott, Mar. 10). This could indicate that infestations might be found in irrigated fields in a number of areas throughout State during spring of 1961. (Gittins, Mar. 10). UTAH - Numerous and active on some farms in Beaver-Minersville area of Beaver County. (Knowlton, Esplin). NEVADA - Infestations, probably this species, in alfalfa ranged 0-8 per square foot in Fallon area, Churchill County, and 0-5 per square foot in Douglas County. Infestations extremely variable from field to field. Damage ranged light to heavy in infested fields, with plants being eaten above and below ground level; growth retarded. (Arnett, Bechtel, Lauderdale, Martinelli).

ARMYWORM (Pseudaletia unipuncta) - ARKANSAS - Adults observed at night in Fayetteville area, Washington County. (Warren).

EUROPEAN CORN BORER (Pyrausta nubilalis) - DELAWARE - No pupation observed as of March 17. (Burbutis, Mason).

BEET ARMYWORM (Spodoptera exigua) - CALIFORNIA - Light population on sweet corn in Encinitas, San Diego County. (Cal. Coop. Rpt.).

LEAFHOPPERS - UTAH - Dikraneura carneola active in fields of small grain and roadside grasses in Box Elder and Davis Counties. (Knowlton). NORTH CAROLINA - Carneocephala sp. remains abundant on oats near Boardman, Columbus County, with spots in fields having been killed. (Read).

SAY STINK BUG (Chlorochroa sayi) - ARIZONA - Medium infestations present in some fields of barley in Pinal County. (Ariz. Coop. Sur.).

BLUEGRASS BILLBUG (Sphenophorus parvulus) - MARYLAND - Four adults taken from grass clump at Flintstone, Allegany County. (U. Md., Ent. Dept.).

ALFALFA WEEVIL (Hypera postica) - GEORGIA - Moderate to heavy on alfalfa in Franklin, Habersham, Pickens, Gordon, Floyd, Polk and Paulding Counties. Fields which were treated with a specific chlorinated hydrocarbon insecticide show very little feeding injury. (Johnson). Infestations building up in Newton County. (Dupree). VIRGINIA - Light, local infestation of young larvae active on alfalfa in Chesterfield County. First report for 1961 in State. (Jones, Mar. 7). DELAWARE - No detectable increase in hatch of overwintering eggs; larvae still present only in alfalfa. Small numbers of eggs freshly laid by overwintering adults present in dead alfalfa stalks. (Burbutis, Mason). COLORADO - Adults active on warm days in Arkansas River Valley; early control recommended. (Colo. Ins. Sur.). UTAH - Adults active in fields of alfalfa in Box Elder, Cache, Weber and Davis Counties. Controls have been applied in a number of northern and central counties on south and west sloping farms. (Knowlton). NEVADA - Egg laying in progress in Churchill, Douglas and Washoe Counties. (Coop. Rpt.). IDAHO - Adults active on warm days in Canyon County; some fields may require treatment in this area. (Waters, Mar. 10).

EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) - CALIFORNIA - Medium infestation of larvae, pupae and adults in alfalfa in San Luis Obispo County; also heavy in alfalfa in Temecula, Riverside County. (Cal. Coop. Rpt.). ARIZONA - Continues heavy in alfalfa on the Yuma-mesa in Yuma County; damage heavy in many fields and second insecticidal applications are being made. Light to medium infestations present in some central area fields. (Ariz. Coop. Sur.).

CLOVER LEAF WEEVIL (Hypera punctata) - IDAHO - Populations of first and second-instar larvae found in alfalfa examined in Parma area, Canyon County; populations generally low, 1-3 per crown. (Waters, Mar. 10). Greater numbers present in fields in Caldwell area of same county. (Bechtolt, Mar. 10). Populations averaged 1-3 per crown in alfalfa sampled in Lewiston area, Nez Perce County. (Gittins, Mar. 10). CALIFORNIA - Single larva found in alfalfa in San Luis Obispo County. (Cal. Coop. Rpt.).

SWEETCLOVER WEEVIL (Sitona cylindricollis) - UTAH - Adults active at Perry, Box Elder County. (Knowlton). NEVADA - Adults ranged 0-7 per alfalfa plant in Fallon Churchill County; mating occurring. (Bechtel, Martinelli).

SPOTTED ALFALFA APHID (Therioaphis maculata) - IDAHO - None found during surveys in Canyon and Owyhee Counties, where infestations were noted during 1960. (Waters, Mar. 10). COLORADO - None have been found in Arkansas River Valley. (Colo. Ins. Sur.). TEXAS - None found in fields examined in north central area to date. (Chada). OKLAHOMA - Although generally light in alfalfa checked in most areas, heavy infestation noted in one field in Tillman County. (Okla. Coop. Sur.). KANSAS - Counts in southeast area less than one per sweep in open fields of alfalfa. On a south-sloping roadside embankment in Montgomery County, counts were as high as 500 per sweep; less than 10 percent winged. Many plants at this location severely damaged. (Peters).

PEA APHID (Macrosiphum pisi) - ARKANSAS - Beginning to increase in northwest area and in upper Arkansas River Valley; 10-15 per square foot becoming more common. (Ark. Ins. Sur.). KANSAS - Counts ranged from less than one to 40 per sweep in southeastern area alfalfa, with majority of counts averaging less than 5 per sweep. On a south-sloping roadside embankment in Montgomery County, counts were as high as 300 per sweep; 50 percent winged at this location. (Peters). OKLAHOMA - Continues to increase in alfalfa in most areas; moderate to heavy in fields checked in central, south central, southwest and west central areas. (Okla. Coop. Sur.). TEXAS - Approximately 50 per linear foot in alfalfa examined in north central area; most alfalfa about 6 inches high. Infestations probably will become very heavy. (Chada). NEW MEXICO - Populations continue heavy on alfalfa in Dona Ana and Roosevelt Counties. (N. M. Coop. Rpt.).

TARNISHED PLANT BUG (Lygus lineolaris) - DELAWARE - Overwintered adults active in most fields of alfalfa. (Burbutis, Mason). OKLAHOMA - Light numbers common in alfalfa checked in most areas. (Okla. Coop. Sur.). KANSAS - Present in few fields of alfalfa and wheat in southeast area; counts less than one per sweep. (Peters).

LYGUS BUGS (Lygus spp.) - IDAHO - Adults occasionally active in Caldwell area, Canyon County. (Bechtolt, Mar. 10). UTAH - Largely L. elisus, active on roadside weeds in Weber and Davis Counties. (Knowlton). NEVADA - Adults active in Fallon area, Churchill County. (Bechtel, Martinelli).

CLOVER LEAFHOPPER (Aceratagallia sanguinolenta) - UTAH - Active in fields of alfalfa in Box Elder and Weber Counties, generally. (Knowlton).

A THRIPS (Frankliniella occidentalis) - ARIZONA - Very heavy populations present on terminal growth of alfalfa statewide; as many as 20-25 nymphs per individual terminal in many fields. (Ariz. Coop. Sur.).

CLOVER MITE (Bryobia praetiosa) - ARIZONA - Medium to heavy on Yuma-mesa alfalfa in Yuma County. (Ariz. Coop. Sur.).

A TINGID (Melanorhopala clavata) - UTAH - Infested rabbitbrush (Chrysothamnus nauseosus) at Randolph, Rich County, September 3, 1959. Det. by C. J. Drake. (Knowlton).

FRUIT INSECTS

PLUM CURCULIO (Conotrachelus nenuphar) - GEORGIA - Adults have been appearing in peach orchards at Ft. Valley since March 6, with average of 0.2 per tree taken that date; no eggs in bodies of adults caught in orchard. As usual, pest appeared from hibernation this year before time for first control treatment. (Snapp).

CALIFORNIA PRIONUS (Prionus californicus) - UTAH - Larvae damaged roots of old cherry trees in orchard being pulled up at Willard, Box Elder County. (Knowlton).

FLATHEADED APPLE TREE BORER (Chrysobothris femorata) - IDAHO - Probably this species, damaging small, 3-year-old apple orchard near Parma, Canyon County.

Growth of trees greatly retarded because of zinc deficiency. About 3 percent of trees girdled, or nearly so. (Scott, Mar. 10).

PEACH TREE BORER (Sanninoidea exitiosa) - MARYLAND - Evidence of injury noted on several young peach trees at Baltimore. (U. Md., Ent. Dept.).

EASTERN TENT CATERPILLAR (Malacosoma americanum) - TEXAS - Appearing on peach, apricot, plum and apple in central and western areas; also on apricot at Boerne, Kendall County. (Newton).

CLIMBING CUTWORMS - UTAH - Numerous in an orchard near Hot Springs, Box Elder County. (Knowlton).

SAN JOSE SCALE (Aspidiotus perniciosus) - NEW MEXICO - Light to extremely heavy in apple orchards in Bernalillo, Sandoval and Rio Arriba Counties. (N. M. Coop. Rpt.). NORTH CAROLINA - Severely infesting 2 apple trees in Sampson County. (Harris, Farrier).

LYGUS BUGS (Lygus spp.) - UTAH - Largely L. elisus, active in orchards in Weber and Davis Counties. (Knowlton). OKLAHOMA - Adults of L. lineolaris noted attacking new buds on peach trees in west central area. (Okla. Coop. Sur.).

A FRUIT TREE MITE (Bryobia rubrioculus) - NEW MEXICO - Eggs abundant on branches in many apple orchards checked in Bernalillo, Sandoval, Rio Arriba and Taos Counties. (N. M. Coop. Rpt.). UTAH - Eggs numerous in home orchards at Perry, Farmington and Ogden in northern area of State. (Knowlton).

A PSYLLID - TEXAS - Numerous galls of an undetermined species found on leaves of avocado plant in Arlington, Tarrant County. Similar galls have been submitted from the Republic of Mexico. Attempts to collect adults for positive identification will be made. (Newton).

TRUCK CROP INSECTS

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Infestations light on lettuce statewide. (Ariz. Coop. Sur.). COLORADO - High populations of adults and nymphs feeding on sprouts of potatoes in storage at shipping plants in Weld County. (Colo. Ins. Sur.). FLORIDA - Averaged 10-15 per leaflet on eggplant and bell peppers at Belle Glade. (Harris). Increasing on cabbage in experimental plots at Sanford, but of little concern as cabbage is now being harvested. (Wilson). DELAWARE - No increase on spinach in Sussex County; numbers remain below one per plant. (Burbutis, Mason).

ASIATIC GARDEN BEETLE (Autoserica castanea) - NORTH CAROLINA - Fed on potatoes, beans and carrots in Jackson County on July 8, 1960. Det. by O. L. Cartwright. This is a new county record. (Gibson).

FLEA BEETLES - UTAH - Undetermined species survived the winter in numbers in Logan area of Cache County. (Knowlton, Mar. 14). GEORGIA - Systena blanda heavy on turnips in Spalding County. (Dupree).

SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata howardi) - ARKANSAS - Becoming active in State. (Warren).

SQUASH BUG (Anasa tristis) - UTAH - Adults active at Ogden, Weber County. (Knowlton).

THRIPS - NEW MEXICO - Unspecified species ranged 3-10 per onion plant in fields in Dona Ana County. (N. M. Coop. Rpt.). ARIZONA - Frankliniella occidentalis very abundant on cantaloups in Yuma County. (Ariz. Coop. Sur.).

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) - CALIFORNIA - Heavy adult population on peas in Madera, Madera County. (Cal. Coop. Rpt.). Becoming heavy on strawberries in Orange County. (J. Wilcox, A. F. Howland).

MELON APHID (Aphis gossypii) - ARIZONA - Light to medium on cantaloups in Yuma County, but heavy enough to require treatment in some fields. (Ariz. Coop. Sur.).

Pests of Cabbage in California - Young, 10-acre planting of cabbage near Puente, Los Angeles County, infested with larvae of DIAMONDBACK MOTH (Plutella maculipennis), CABBAGE LOOPER (Trichoplusia ni), IMPORTED CABBAGEWORM (Pieris rapae) and CABBAGE APHID (Brevicoryne brassicae). Plantings near Corona, Riverside County, heavily infested with cabbage aphid. Light infestations of cabbage looper and cabbage aphid present in 20-acre planting of cabbage near San Juan Capistrano, Orange County. (M. W. Stone).

CABBAGE LOOPER (Trichoplusia ni) - FLORIDA - Becoming noticeable on cabbage at Homestead where some heads are being harvested. (Wolfenbarger).

A SERPENTINE LEAF MINER - FLORIDA - Appears to be on decline throughout the State; parasites increasing. However, some scattered infestations remain serious. In Palm Beach County, there is increasing difficulty in control with certain insecticides. (Hayslip). Averaged only one live larva per leaflet on celery at Belle Glade, with 50 percent of overall population dead from natural mortality. (Harris).

Beet Leafhopper Survey in Texas - Spring 1961: The survey throughout the southwestern and western areas for beet leafhopper (Circulifer tenellus) began February 23 and was completed March 6. An approximate total of 4,650 samples were taken, with 604 beet leafhoppers being found. The average for the areas surveyed was 15.3 per 100 square feet compared with 3.95 per 100 square feet in 1960. Beet leafhopper counts in the El Paso Valley were the highest that have ever been recorded on a beet leafhopper survey in the area. Counts showed populations in the El Paso Valley to be 232 beet leafhoppers per 100 square feet. This is 13 times greater than the 1960 survey counts. Townmustard was one of the main host plants in this area, being plentiful, succulent and in good condition. Flixweed, which was also plentiful, was the next most important host plant in this vicinity. Populations remained low but shifted slightly throughout the remainder of the areas surveyed in the State. Average counts per 100 square feet by areas were as follows: Area 1 (Crystal City-El Paso-Monahans) - 26.7; area 2 (Sonora-Abilene-Monahans) - 1.25; area 3 (Abilene-Lamesa-Hereford-Floydada) - 0.63. (O. M. Boyd et al.).

SUGAR-BEET WIREWORM (Limonius californicus) - CALIFORNIA - Severely damaging 80 acres of seedling bunch onions near Saugus, Los Angeles County. Entire acreage was planted to asparagus for 6 years and never treated with a soil insecticide. (M. W. Stone).

AN APHID (Macrosiphum barri) - ARIZONA - Light on lettuce in Maricopa County. This species appears to be more abundant in most cases than green peach aphid. (Ariz. Coop. Sur.).

STRAWBERRY APHID (Pentatrichopus fragaefolii) - CALIFORNIA - Slowly building up on strawberries because of warm weather in Orange County. (J. Wilcox, A. F. Howland).

SPIDER MITES (Tetranychus spp.) - MARYLAND - Light to moderate numbers of eggs noted on strawberry foliage at Fairland, Montgomery County. (U. Md., Ent. Dept.).

COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis) - TEXAS - Debris inspection in Live Oak, Bee and McMullen Counties revealed averages of 2.12, 0.54 and 0 live adults respectively, per 100 bolls inspected. (Texas Coop. Rpt., Edgar).

PINK BOLLWORM (*Pectinophora gossypiella*) - TEXAS - Debris inspection in Live Oak, Bee and McMullen Counties revealed averages of 22.87, 11.63 and 14.0 live larvae, respectively, per 100 bolls inspected. (Texas Coop. Rpt., Edgar).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

BARK BEETLES - CALIFORNIA - *Dendroctonus brevicomis* and *Ips* sp. activity increasing on ponderosa pine in several areas of Sierra National Forest. Small acreages with 15-250 trees killed in groups of 5-25 in Nutmeg, Oak Flat, Fence Meadows and Soaproot Saddle areas and in a 940-acre stand in Miami Mountain area. (A. E. Konvalin, B. Johnson). *D. brevicomis*, *D. jeffreyi*, *D. valens* and *Ips* sp. killing ponderosa and Jeffrey pines in groups of 20-40 in a 16,000-acre and a 85,000-acre stand in Hat Creek District of Lassen National Forest. This area had sanitation-salvage work during 1960 and present damage, while currently increasing, is much less than during 1960. (O. F. A. Sapousek). *D. brevicomis* and *D. valens* caused many recent fades and are infesting green trees in groups of 50-75 Jeffrey and ponderosa pines in a 1000-acre stand in Barton Flats and Camp Angeles area of San Bernardino National Forest. Poles, young sawtimber and mature trees were affected in this aggressive infestation. (J. Pierce). TEXAS - Control for *D. frontalis* completed along severely pruned tight-of-way in Hardin County. Infestations found in a few individual trees scattered throughout the epidemic area. (Texas For. Pest Comm., Jan.-Feb. Rpt.). NORTH CAROLINA - *D. terebrans* moderate in long leaf pine locally in Robeson County. (Hayes, Farrier).

A PLATYPODID (*Platypus* sp.) - NORTH CAROLINA - Moderate infestations present in long leaf pines locally in Robeson County. (Hayes, Farrier).

A PINE REPRODUCTION WEEVIL (*Cylindrocopturus eatoni*) - CALIFORNIA - Outbreaks occurring in natural ponderosa pine reproduction along 8-10 miles of Amo Ranch Road and in small groups of sugar pine in Grey Eagle Hill, El Dorado National Forest. (G. B. Hill, D. Jones).

NANTUCKET PINE TIP MOTH (*Rhyacionia frustrana*) - ARKANSAS - Emergence practically complete in southern portion of State; adults very active in young pine. (Warren). MARYLAND - Pupae observed on pine terminals at Towson, Baltimore County. (U. Md., Ent. Dept.).

PINE WEBWORM (*Tetralopha robustella*) - VIRGINIA - Common on new planting of loblolly pine near Christiansburg, Montgomery County; about 26 acres involved. (Tarpley, Feb. 27).

PINE BARK APHID (*Pineus strobi*) - ARKANSAS - Active on young pine in southern area. (Warren).

A PINE APHID (*Cinara* sp.) - CALIFORNIA - Heavy populations attacking mature single Coulter pines in Lytle Creek area of San Bernardino National Forest. Activity of this aphid at this time of year is unusual. (J. Pierce).

TENT CATERPILLARS (*Malacosoma* spp.) - NORTH CAROLINA - *M. americanum* began seasonal appearance in crotches of wild cherry in Columbus County March 14. (Read). ARKANSAS - Second-instar larvae of *M. disstria* collected in southern area during period March 11-17. (Warren).

BAGWORM (*Thyridopteryx ephemeraeformis*) - VIRGINIA - Infesting pine at Elk Creek, Grayson County. (Rowell, Simpson; Mar. 8).

A GALL MIDGE - OKLAHOMA - Larvae of undetermined species attacking flowering portion of some elms in northeastern quarter of State. (Okla. Coop. Sur.).

ELM LEAF BEETLE (*Galerucella xanthomelaena*) - UTAH - Survived the winter well in Salt Lake City, Salt Lake County. (Knowlton, Mar. 10).

A CLEARWING MOTH (*Ramosia mellinipennis*) - CALIFORNIA - Heavy larval population on *Ceanothus* sp. nursery stock in Hillsborough, San Mateo County. (Cal. Coop. Rpt.).

A BARK BEETLE (*Phloeosinus cristatus*) - CALIFORNIA - Adults heavy on cypress and arborvitae in Yuba City, Sutter County. (Cal. Coop. Rpt.).

COCCIDS - ARKANSAS - An undetermined diaspid active on young pine in southern area; *Toumeyella* sp. also active on pine in same area. (Warren). CALIFORNIA - *Ceroplastes cirripediformis* heavy on gardenia in Tulare, Tulare County, and light in Corona, Riverside County. *Asterolecanium minus* heavy on chestnut oak in State park in Sacramento, Sacramento County; infestation does not respond to control. *Comstockiella sabalis* infesting palm on property in Montecito, Santa Barbara County; this is only known infestation in State and eradication treatment is contemplated. (Cal. Coop. Rpt.). OKLAHOMA - *Aspidiotus perniciosus* common on a variety of trees and shrubs in Oklahoma County; controls reported giving good results where applied. (Okla. Coop. Sur.). NORTH CAROLINA - *Pseudaulacaspis pentagona* infesting *Ligustrum* sp. in Wake County and umbrellatree in Randolph County; both locally. (Jones, Farrier).

AN ARBORVITAE APHID (*Cinara tujafilina*) - OKLAHOMA - Moderate to heavy on arborvitae throughout most areas of State. (Okla. Coop. Sur.). NEVADA - Light to heavy on arborvitae in Fallon, Churchill County; and Reno-Sparks, Washoe County. (Bechtel). Medium on same host in a nursery in Henderson, Clark County. (Nichols).

APHIDS - NEW MEXICO - An undetermined species very abundant on petunias in Las Cruces area, Dona Ana County. (N. M. Coop. Rpt.). OKLAHOMA - Several species becoming active on a variety of ornamental plants in several areas of State. (Okla. Coop. Sur.).

POTATO PSYLLID (*Paratrioza cockerelli*) - CALIFORNIA - Heavy adult population on *Solanum pseudocapsicum* in a nursery at Bellflower, Los Angeles County. (Cal. Coop. Rpt.).

BOXWOOD LEAF MINER (*Monarthropalpus buxi*) - VIRGINIA - Heavily infested boxwood at a home in Roanoke, Roanoke County, Feb. 24 (Rowell, Tucker); infested same host in Fredericksburg, Spotsylvania County, March 7 and in Hopewell, Prince George County, March 3 (Rowell); and in Richmond, Henrico County, March 9 (Rowell, Davis).

A HOLLY LEAF MINER (*Phytomyza* sp.) - MARYLAND - Larvae heavy on American hollies at Rockville, Montgomery County. (U. Md., Ent. Dept.).

TWO-SPOTTED SPIDER MITE (*Tetranychus telarius*) - CALIFORNIA - Adults heavy on nightshade in Pauma Valley, San Diego County. (Cal. Coop. Rpt.).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE GRUBS (*Hypoderma* spp.) - UTAH - Now numerous in backs of cattle in several areas of Weber and Box Elder Counties. (Knowlton). OKLAHOMA - Adults of *H. lineatum* active and annoying cattle in south central and southwest areas on March 13. This is first adult activity reported in State this year. (Okla. Coop. Sur.).

CATTLE LICE - OKLAHOMA - Moderate to heavy infestations of several species continued common on untreated cattle in most areas of State. (Okla. Coop. Sur.). SOUTH DAKOTA - *Haematopinus eurysternus* and *Bovicola bovis* heavily infesting many untreated herds in Brookings County. (Mast). UTAH - Various species numerous in some Wayne County herds. Causing cattle to rub at Perry and Brigham, Box Elder County; and at Ogden, Weber County; 9,000 cattle dipped for control in Emery County. Treatment applied to 5,000 cattle in Beaver County, with 1,000 more to be treated soon. (Knowlton).

HOG LOUSE (*Haematopinus suis*) - OKLAHOMA - Moderate to severe infestations continued common on untreated hogs in many areas. (Okla. Coop. Sur.).

A CONENOSE (*Triatoma* sp.) - CALIFORNIA - Light adult population found in a home and in a dooryard at Anza, Riverside County. (Cal. Coop. Rpt.).

MASKED HUNTER (*Reduvius personatus*) - UTAH - Attracted to lights at a motel in Nephi, Juab County, July 29, 1959. Det. by D. M. Weisman. (Knowlton).

MOSQUITOES - UTAH - Larvae of undetermined species present in northern part of State. (Knowlton). TEXAS - *Anopheles quadrimaculatus* continued present in numbers in a restricted area of Jefferson County this year as compared with being entirely absent at same date in 1960. *Uranotaenia sapphirina* appeared much earlier this year than in 1960. (Jefferson Co. Mosq. Cont. Comm., Feb. Rpt.).

SECONDARY SCREW-WORM (*Callitroga macellaria*) - NORTH CAROLINA - Reported infesting hogs in Jones County on December 6, 1960. Det. by C. W. Sabrosky. (Franck).

SHEEP KED (*Melophagus ovinus*) - IDAHO - Adults average about 10 per lamb in large herd in Arna Valley area of Canyon County. (Waters, Mar. 10).

HOUSE FLIES - OKLAHOMA - Adults of *Musca domestica* and *Fannia cunicularis* becoming active during warm periods in Stillwater area, Payne County. (Okla. Coop. Sur.).

A BLACK FLY (*Cnephia pecuaria*) - TEXAS - Several adults caught in light trap at Port Arthur, Jefferson County, January 31. Det. by Wiseman. (Jefferson Co. Mosq. Cont. Comm., Feb. Rpt.).

LONE STAR TICK (*Amblyomma americanum*) - ARKANSAS - First collections of this spring, both male and female, made in northwest area on March 4. Species also rather active in southern portion of State. (Warren).

DOG FOLLICLE MITE (*Demodex canis*) - NORTH CAROLINA - Two cases reported to State Veterinarian during February. (Zweigart).

BENEFICIAL INSECTS

CONVERGENT LADY BEETLE (*Hippodamia convergens*) - OKLAHOMA - Light numbers of adults and larvae noted in alfalfa and small grain checked in most areas. (Okla. Coop. Sur.). KANSAS - Counts in open fields were zero. Counts were as high as 2 adults and larvae per sweep on a south-sloping roadside embankment planted to to alfalfa in Montgomery County. (Peters).

NABIDS (*Nabis* spp.) - OKLAHOMA - Light numbers common in alfalfa and small grains surveyed in most areas of State. (Okla. Coop. Sur.).

LACEWINGS (*Chrysopa* spp.) - OKLAHOMA - Adults common in alfalfa and small grains checked in Beckham County; limited numbers present in alfalfa checked in Choctow and Bryan Counties. (Okla. Coop. Sur.).

HONEY BEE (*Apis mellifera*) - NEW MEXICO - Becoming active in southern counties. (N. M. Coop. Rpt.).

A BRACONID PARASITE (*Aphidius testaceipes*) - OKLAHOMA - Limited numbers present in fields of small grain infested with aphids in south central, southwest, west central, central and north central areas. (Okla. Coop. Sur.).

A MYMARID WASP (*Cosmocomoidea morrilli*) - FLORIDA - Collected at Tampa, Hillsborough County, on February 27 by J. W. Patton. This is the second specimen of this internal egg parasite in the collection of the Plant Industry Division. (Fla. Coop. Sur.).

AN ICHNEUMONID (Coccygomimus sp.) - FLORIDA - Specimens collected at Tampa, Hillsborough County, on February 27 by J. W. Patton are the first representatives of this genus in the collection of the Plant Industry Division. (Fla. Coop. Sur.).

MISCELLANEOUS INSECTS

CUTWORMS - NEVADA - Undetermined species causing heavy damage to garden plants in Overton, Clark County. (Zoller).

NOCTUIDS - UTAH - Adults of various species coming to light traps at Logan, Cache County, on warm evenings. (Knowlton).

LUNA MOTH (Actias luna) - ARKANSAS - Observed on March 14, an early date for this area. (Warren).

SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus) - MARYLAND - Numerous adults noted on enclosed porch of a home at Hagerstown, Washington County. (U. Md., Ent. Dept.).

CARPET BEETLES - DELAWARE - Considerable numbers of Anthrenus scrophulariae found in rugs and upholstery in a Kent County home. (Stockbridge). Light infestation of Attagenus piceus in home in New Castle County. (Bray).

A POWDER-POST BEETLE (Lyctus sp.) - SOUTH DAKOTA - Reported working in oak flooring in a home in Lincoln County. (Mast).

STRAWBERRY ROOT WEEVIL (Brachyrhinus ovatus) - UTAH - Adults found in home at Ogden Weber County; also common in leafmold in Logan and Blacksmith Fork Canyons, Cache County. (Knowlton, Mar. 14).

BOXELDER BUG (Leptocoris trivittatus) - VIRGINIA - Reported as a nuisance in and around homes in Spotsylvania, Tazewell, Craig, Culpeper and Franklin Counties during late February and early March. (Kash, Rowell, McDonald, Fields, Hutcheson, Tucker). UTAH - Annoying in schools and homes at Logan, Cache County. (Knowlton, Mar. 10). Causing serious problem at Richmond by entering school rooms; also annoying in homes in Ogden Canyon, Willard and Farmington in northern part of State. (Knowlton).

A PENTATOMID (Banasa euchlora) - UTAH - Collected at light of a motel in Nephi, Juab County, on July 29, 1959. Det. by D. M. Weisman. (Knowlton).

GERMAN COCKROACH (Blattella germanica) - SOUTH DAKOTA - Infesting a home at Roscoe, Edmunds County. (Mast).

MAYFLIES - ALABAMA - Large flights occurred in most coastal areas of Mobile County during mid-February. (Seibels).

TERMITES - DELAWARE - Spring swarming flights of Reticulitermes flavipes rather numerous in New Castle County. (Burbutis, Mason). NORTH CAROLINA - R. flavipes swarming in Wake County. (Jones, Farrier). NEVADA - Winged adults of R. hesperus emerging in Fallon, Churchill County; and at Reno, Washoe County. (Bechtel, Lukens) WISCONSIN - Alates of an undetermined species recovered in office building in Superior, Douglas County, March 9. (Wis. Coop. Sur.).

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - NORTH CAROLINA - Winged reproductive forms observed on surface of one mound in Carteret County on warm day during reporting period. In one pasture with higher-than-average density of mounds, practically every colony was moving to a new location; one "run" of over 60 feet was found. (Branan).

ANTS - VIRGINIA - Winged forms present at Springfield, Page County, February 24 (Rowell) and in Halifax County March 7 (Hall). Ants also observed swarming and mating in Blacksburg, Montgomery County, March 5. (Tarpley). MARYLAND - Winged forms of *Acanthomyops interjectus* noted around home at Rockville, Montgomery County; same forms of *Prenolepis imparis* observed swarming on utility pole at University Park, Prince Georges County. (U. Md., Ent. Dept.). NORTH CAROLINA - Infestation of *Acanthomyops* sp. present in house in Wake County March 9. (Rabb, Farrier). SOUTH DAKOTA - *Camponotus pennsylvanicus* present in a home in Chamberlain, Brule County. (Mast).

A CHALCID (*Ceratosmicra debilis*) - FLORIDA - Collected at Tampa, Hillsborough County, on February 27 by J. W. Patton. These are the second and third specimens in the collection of the Plant Industry Division. (Fla. Coop. Sur.).

A MARCH FLY (*Bibio* sp.) - VIRGINIA - Larvae extremely abundant in mosses in flower bed at Bealeton, Fauquier County (Tarpley, Rowell; Mar. 9) and under sod in lawn at Staunton, Augusta County (Tarpley, Morse; Mar. 7).

CLOVER MITE (*Bryobia praetiosa*) - UTAH - Entering homes in northern area of State at Ogden, Farmington and Clearfield. (Knowlton).

MILLIPEDES - VIRGINIA - Entering homes in Lancaster County (Rowell, McSwain; Mar. 3); Luray, Page County (Saunders, Jr., Feb. 24); and at Galax, Carroll County (Rowell, Mar. 10).

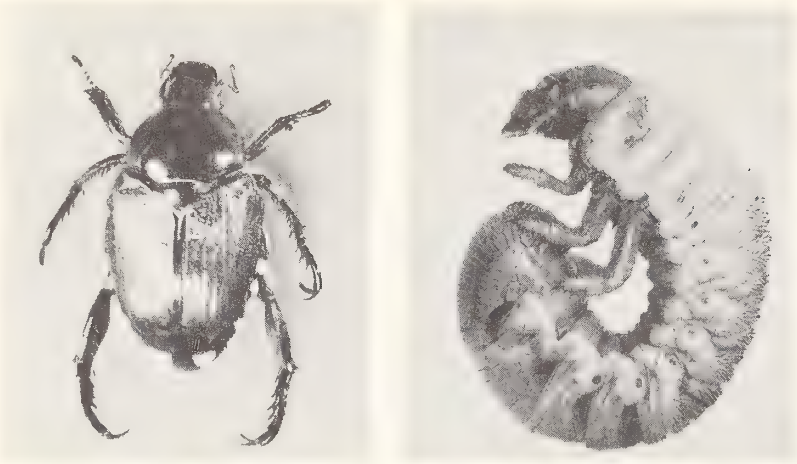
LIGHT TRAP COLLECTIONS

	Pseud. unip.	Agrot. ips.	Feltia subterr.	Perid. saucia	Prod. ornith.	Trich. ni
ARIZONA						
Mesa 3/6-12				5	1	8
MISSISSIPPI						
*Stoneville 3/14-16	84	10	6	65	6	
SOUTH CAROLINA						
Clemson 3/11-17	1	1		1	3	
Charleston 3/12	5	2	29		1	
Charleston 3/19	3	2	19			

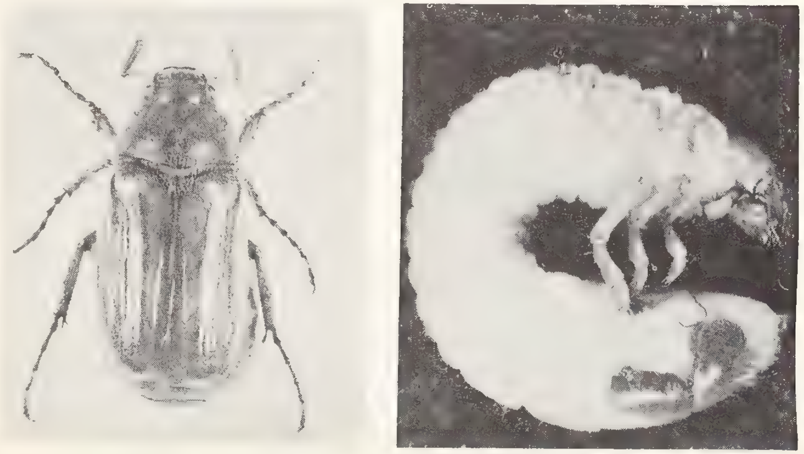
---

* Two traps - Stoneville

MEANS OF RECOGNIZING LARVAE OF JAPANESE BEETLE AND EUROPEAN CHAFER



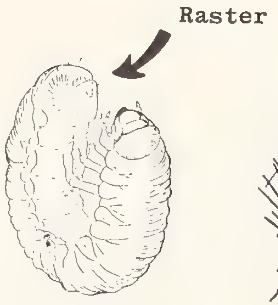
Japanese Beetle Adult and Larva

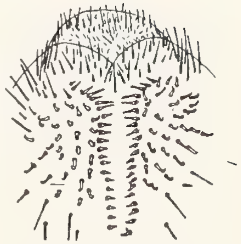


European Chafer Adult and Larva

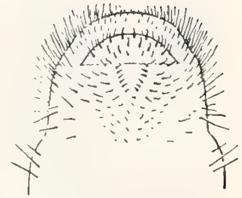
Survey and Detection Operations,
PPC, ARS, USDA

Rastrel Pattern of Some Common Scarabaeid Grubs

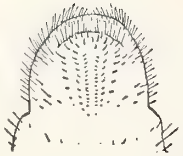




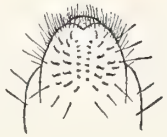
European chafer
(*Amphimallon majalis*)



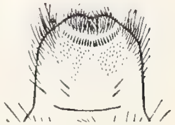
Japanese beetle
(*Popillia japonica*)



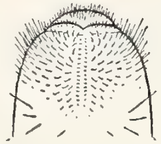
oriental beetle
(*Anomala orientalis*)



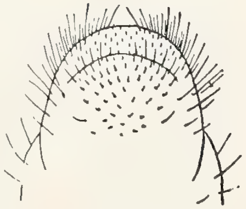
rose chafer
(*Macrodactylus subspinosus*)



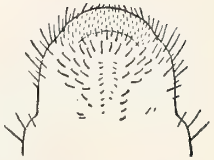
Asiatic garden beetle (*Autoserica castanea*)



Phyllophaga ephilida



Cyclocephala sp.



Strigoderma arboricola

Grub showing location of raster. Raster of *A. majalis*, *P. japonica* and *Cyclocephala* sp. courtesy of Cornell University. Other illustrations USDA.

Adult Description of Japanese Beetle and European Chafer

The adults of Japanese beetle (*Popillia japonica* Newm.) are 10 to 12 mm. long; shiny, metallic-green in color, with coppery-brown elytra. The species can readily be recognized by the presence of 6 small patches of white along each side and the back of the abdomen, just under the edges of the elytra.

The European chafer (*Amphimallon majalis* (Raz.)) is similar in appearance and color to *Phyllophaga tristis*, which it closely resembles, and is approximately the same size. The European chafer can be readily separated from *P. tristis* by the extremely finely, densely punctate pronotum which is angulate, with larger more separated punctures at middle of base; and by the middle hind tibiae having an inner row of well separated, heavy setae or spines.

The European chafer is fawncolored, with a rufous-yellow head and pronotum. The antennae, legs and body are concolorous. A narrow band of light yellow hairs marks the caudal margin of the pronotum. The thoracic sternites, or under plates, are covered with a thick layer of pale yellow to grayish-white hairs.

The eyes are large and conspicuous. The antennae are nine-segmented in both sexes and are of the lamellate type. The six basal segments form the scape and pedicel, while the three distal segments are flattened to form a club called the flagellum. That of the male is much longer than the female's and is an excellent characteristic for determining the sexes in the field. The pronotum is nearly twice as wide as it is long, and its margins are strongly curved anteriorly and laterally. The elytra, or wing covers, are heavily costate and finely punctated; they extend posteriorly to the middle of the penultimate segment, leaving the pygidium exposed when the beetle is viewed from above. The costae on the elytra are much more pronounced than in *Phyllophaga tristis* or any other of the North American *Phyllophaga*.

The second and third pairs of legs are nearly alike but the first, or prothoracic pair, is modified for digging. The prothoracic tibia is heavily sclerotized and flattened, and its outer margin is equipped with three large teeth. Its minor margin has a spur located opposite the middle tooth, found on the outer side. The tarsi of all the legs are made up of five segments, with the first four nearly equal in length and the fifth, or distal, segment somewhat longer. The segments are cylindrical in cross section, but each one in turn is enlarged at its distal end.

The sexes of the European chafer can be readily separated. The males are somewhat smaller than the females averaging about 13.7 mm. in size compared with an average of 14.3 mm. in the female. Furthermore, the sternum of the abdomen of the male is somewhat darker than in the female. In addition to these and the genital characteristics, the males can be readily distinguished, as previously indicated, by the longer flagella of the antennae.

Adult descriptions of Japanese Beetle and European chafer prepared in Survey and Detection Operations, ARS, USDA, in cooperation with the U. S. National Museum. CEIR 11(12):3-24-61.

Summary of Insect Conditions - 1960
(continued from page 187)

FRUIT INSECTS

Pomaceous and Stone Fruit Insects: CODLING MOTH (Carpocapsa pomonella) populations were generally light during 1960 and caused only negligible losses to apples. Damage, when it did occur, was mostly restricted to poorly treated or neglected orchards. In the East, populations were low throughout the season in MAINE, NEW HAMPSHIRE, MASSACHUSETTS, CONNECTICUT, Hudson Valley of NEW YORK, PENNSYLVANIA, DELAWARE, MARYLAND and GEORGIA. Populations in the Hudson Valley of New York were less troublesome than for the past 3 years, but the second brood was somewhat heavier than normal in Maine. The first adults were trapped in bait pans in the Brushy Mountains of NORTH CAROLINA on April 4 and adults first emerged May 5 in Delaware, with the first fruit entry noted on May 22 in that State.

Codling moth emergence was split by cool weather during the early season in ILLINOIS which lengthened the control period, but controls were very good for the season. In WISCONSIN, adults began emerging in the southeast, south central and Gays Mills area about the end of May. Egg laying continued until about July 8, and by July 29, second-brood moths were being caught in Dane County. By September 2, larvae of the second generation had emerged from fruit in the southern counties. Despite moderate populations, codling moth caused a minimal amount of loss in the majority of Wisconsin orchards. Populations of the pest were moderate in neglected MINNESOTA orchards, with controls being very effective in commercial orchards. Codling moth infestations in MISSOURI were unusually light generally through the first and second broods, but a partial third brood appeared coincidentally with the Jonathan harvest which presented problems in control. Infestations in ARKANSAS were about the same as in 1959. Codling moth was generally light throughout the season in KANSAS and only a trace infestation was observed at Fargo, NORTH DAKOTA.

Codling moth caused only limited damage in OKLAHOMA, but reduced yields of apples in COLORADO and caused losses in pear orchards in the latter State. The pest was a problem in untreated orchards in NEW MEXICO and complaints were common in NEVADA. Infestations in well treated UTAH orchards ran 5-30 percent or more; untreated and poorly treated orchards were often 100 percent "wormy". Early broods were light in Utah, with most infestations coming from the late-season brood. Codling moth emergence in WASHINGTON was late because of cold weather and in general was not a serious problem. In OREGON, adults of the pest first appeared May 5-10 in all areas except the Hood River area where emergence was delayed until June 1. Eggs hatched in Medford May 24. A cool spring delayed development of hatch in Oregon, but warm weather caused increased moth activity in the Willamette Valley and Jackson County necessitating an additional cover spray to prevent late larval entries. Codling moth occurs in all fruit and nut growing areas of CALIFORNIA. Considerable variance in control was obtained in 1960 and DDT is being replaced by other insecticides in many areas where poor control was noted. Poor timing due to weather conditions was probably responsible for many infestations and lack of control.

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) was generally not a problem in 1960, although relatively heavy populations did cause some trouble in certain areas of the country at various times. Populations appeared to have increased substantially in some areas of MAINE, but infestations were well controlled. Red-banded leaf roller populations were reduced in NEW HAMPSHIRE, CONNECTICUT and MASSACHUSETTS, and were generally light on apples in MARYLAND. The first spring catch of moths in bait pails in the Brushy Mountains of NORTH CAROLINA was on April 25; and the first adults and egg masses were observed in Kent County, DELAWARE, on April 15, with the first egg-mass hatch recorded on April 29. nfestations in Delaware were much lighter than expected from the heavy buildup in the fall of 1959, but caused no economic damage though present in orchards throughout the season. Red-banded leaf roller posed a threat in orchards in Adams and Franklin Counties, PENNSYLVANIA, and caused some damage to cherries and other fruit in Erie County, but the pest was under control in the former counties before any damage occurred.

Red-banded leaf roller carryover was light in ILLINOIS and control measures were generally stronger than signs indicated. By fall, however, control problems had developed in a few Illinois orchards. In WISCONSIN, egg laying began on Door County apples the first week of May and moderately heavy populations were observed. The second-generation adults were numerous in light traps in Door, Crawford and Dane Counties, with counts of over 200 per night being recorded in Door County during the latter part of July. Larval populations were above normal in the major fruit-growing areas of Wisconsin. Red-banded leaf roller activity and injury in KANSAS remained light throughout the season except for 3 problem orchards in the northeastern area where at least 25 percent of the fruits were injured. The pest was prevalent on apples in IOWA and was present in threatening numbers early in the season in MISSOURI, but it was adequately controlled in most instances in the latter State. Later broods in Missouri were repressed by dry weather and other factors. In August, a brood appeared which could have been destructive, but was controlled in well treated orchards. In NEW MEXICO, only an occasional red-banded leaf roller larva was found in apple orchards in Bernalillo County.

FRUIT-TREE LEAF ROLLER (*Archips argyrospilus*) was unusually abundant in the Hudson Valley of NEW YORK on apple and ornamentals and was rather common in terminals of young untreated fruit trees during early May in DELAWARE. Larvae could be found in most ILLINOIS orchards, with a general rise in population being possibly indicated. Fruit-tree leaf roller larvae were observed in Door County, WISCONSIN, the last week of May and adults began emerging by the end of June and continued until mid-July. However, only light to moderate numbers occurred in Wisconsin and injury was slight. In MISSOURI, a heavy flight of moths occurred in June; the first real infestation noted in the State for many years. Blacklight traps at Columbia recorded 38 moths on June 11, 384 on June 12-13, 80 on June 14, 129 on June 25, 345 on June 16, 13 on June 22, 9 on June 23 and 9 on June 25. Damage by this pest was very light in Taos County, NEW MEXICO. In CALIFORNIA, fruit-tree leaf roller was medium to heavy on prune and apricot in Santa Clara County and medium on apples in Tuolumne County.

OBLIQUE-BANDED LEAF ROLLER (*Archips rosaceanus*) was unusually abundant on untreated apple in the Hudson Valley of NEW YORK and larvae of *Pandemis lamprosana* were rather common in terminals of young untreated trees during early May in DELAWARE. Unspecified LEAF ROLLERS were lighter than in 1959 in ARKANSAS, but *Platynota flavidana* was prevalent on apples in IOWA.

EYE-SPOTTED BUD MOTH (*Spilonota ocellana*) populations were markedly decreased throughout NEW HAMPSHIRE, but showed increases in many areas of MAINE. Damage in the latter State was above the usual level except where specific control measures were applied. In WISCONSIN, larvae were observed entering apple buds by May 15 in Door County and by the end of May heavy populations were forming nests in the terminal leaves of cherries in that county. Pupation started in mid-June and adults of eye-spotted bud moth began emerging by July 8. Although injury due to this insect was apparently less than that done by certain other fruit pests in Wisconsin, populations were generally normal. In OREGON, eye-spotted bud moth appeared on prune and cherry orchards in the Willamette Valley and on apple, pear and cherry home plantings near Talent, Jackson County, during the late spring. Webbing of buds and leaves was common in several orchards, with larvae reaching maturity about May 15. Eye-spotted bud moth was generally heavy on prunes in Santa Clara County, CALIFORNIA.

UNSPOTTED TENTIFORM LEAF MINER (*Callisto geminatella*) was widespread in ILLINOIS, but offered no particular control problem; and evidence of this species could easily be found in most orchards in KANSAS, although no known problem developed. In MISSOURI, the pest was conspicuously absent.

ORIENTAL FRUIT MOTH (*Grapholitha molesta*) was damaging in some areas of the country, but not generally. In GEORGIA, this pest caused more damage to the peach crop than usual, with some growers complaining of larvae in harvested peaches and in at least one case the infestation was sufficient to throw the fruit out of grade. The general infestation in Georgia was heavier than that of an average year. Week-old larvae were observed in green peaches from an orchard at Fort Valley as early as April 18. Oriental fruit moth infestations were heavy and worse than in 1959 in ARKANSAS. The species was found on plum in East Baton Rouge Parish, LOUISIANA, in April and May; and moths were present in most peach orchards early in the season in MISSOURI, but in variable numbers in various orchards in Missouri, depending on the efficiency of controls the previous season. In some sections of Missouri, most of the fruit was killed by a late-season freeze, and in these orchards, moths were heavy in terminals early in the season but were practically wiped out when the drought prevailed. In KANSAS, one of the worst infestations in many years developed in the south central area. All orchards were infested. At least 3 orchards had over 90 percent "wormy" fruit. Late first and second generations of oriental fruit moth larvae entered the fruit rather than the twigs. Most injury in Kansas resulted from poor timing and poor treatment conditions. The overwintering carryover of oriental fruit moth in ILLINOIS was expected to be high, but very cool nights during the first-brood oviposition period apparently reduced egg laying. Infestations were light in the first generation, but sufficiently high numbers survived on a few new plantings and poorly treated blocks to result in control problems later in the season. In MICHIGAN, the comparatively warm late summer weather brought on discontinuous outbreaks on peaches. Oriental fruit moth heavily attacked terminals and fruit of untreated peach trees and fruit of untreated apples generally over DELAWARE throughout the season. The first spring catch of moths in NORTH CAROLINA was in the Brushy Mountains on April 18. Populations in CONNECTICUT were below average, being almost absent during June due to the very low temperatures.

Oriental fruit moth was medium to heavy in local areas of San Joaquin and Butte Counties, CALIFORNIA, on peaches. In OREGON, the first moth was trapped near Salem May 9. The total trapping operations in Oregon recovered a total of 119 moths, all from the Salem area of infestation.

PEACH TREE BORER (*Sanninoidea exitiosa*) control is still the number one peach insect problem in GEORGIA, although the infestation in 1960 was not as heavy as that in 1959. Infestations of peach tree borer were very abundant in some peach orchards in Lincoln Parish, LOUISIANA, in February; and populations of the pest were rather heavy in the eastern peach-growing section of TEXAS. In ARKANSAS, infestations were about the same as in 1959, with treatments being applied very effectively statewide. Larval counts averaged 0.57 larva per tree in a peach orchard in Payne County, OKLAHOMA, during early May, with other counts somewhat lower in other sections of the State. Peach tree borer emergence in south central KANSAS started during the first week of July and 52 pupal cases were counted on one check tree in experimental plots on July 24. Infestations were troublesome in IOWA, heavy generally in stone fruit orchards in UTAH and heavy in Cochise County, ARIZONA, peach trees in January, February and March. In some orchards in Arizona, 80 percent of the trees were infested.

WESTERN PEACH TREE BORER (*Sanninoidea exitiosa graefi*) damage was general in stone fruit orchards in UTAH; and the pest was severely damaging to one peach orchard in Washington County and young prune plantings in the Milton-Freewater area of OREGON. In the latter area, adults were observed emerging from tree trunks August 3. In WASHINGTON, a few heavy infestations were found in peach, prune and apricot orchards in the lower Yakima Valley during the spring; however, infestations were controlled where trunk sprays were applied the previous fall.

PEACH TWIG BORER (*Anarsia lineatella*) caused damage to fruits and quite generally twigs in UTAH; responsible for much loss that occurred to peaches in COLORADO; and was abundant and caused considerable damage to twigs and fruit at Milton-Freewater in OREGON where timing of controls were not accurate. Peach twig borer was a general pest of deciduous fruits in CALIFORNIA. Infestations continued all year and probably required more treatment than usual. In WASHINGTON, the pest caused injury to peach fruits in the Yakima Valley, but was about normal (0-10 percent).

ELM SPANWORM (Ennomos subsignarius) infestations were light to moderate on apples in GEORGIA, but were easily controlled where growers were on a regular treatment schedule. CANKERWORMS were abundant early in the season in CONNECTICUT and caused severe defoliation in untreated orchards. Commercial orchardists in Connecticut found it necessary to spray to control these pests.

EASTERN TENT CATERPILLAR (Malacosoma americanum) was quite noticeable along roadsides in DELAWARE, especially on apple and wild cherry; commonly found on apple and black cherry trees in April and May in INDIANA; caused some damage to Japanese plum in East Baton Rouge Parish, LOUISIANA; moderate to heavy on native plums throughout eastern OKLAHOMA during the spring and summer, being somewhat heavier than reported during the past 2 years; and rather heavy in peach and plum orchards in eastern TEXAS. ORANGE TORTRIX (Argyrotaenia citrana) infestations were light to medium on apricots in Alameda County and apples in Sonoma County, CALIFORNIA.

FALL WEBWORM (Hyphantria cunea) populations were considerably above normal during 1960 in MAINE, where damage was found in abandoned or untreated fruit. In CALIFORNIA, WESTERN TUSSOCK MOTH (Hemerocampa vetusta) damaged prunes in Santa Clara County. EUROPEAN CORN BORER (Pyrausta nubilalis) was found entering fruit in late September and early October in New Castle County, DELAWARE. CLIMBING CUTWORMS caused less damage in orchards than usual in Grand, Box Elder, Salt Lake, Utah and Weber Counties, UTAH, but caused serious peach fruit deformation in some orchards in WASHINGTON.

PLUM CURCULIO (Conotrachelus nenuphar) was generally light and did not cause more than normal damage in most areas. Populations in GEORGIA were not as heavy as those of 1958 and 1959 and the hibernating population of adults in the Georgia Peach Belt in the winter of 1960-61 is not greater than that of an average year. Little commercial injury was sustained in DELAWARE and PENNSYLVANIA and numbers were less than usual in CONNECTICUT. The pest was not unusually severe in commercial apple orchards in VIRGINIA, where damage was considerably less than one percent; however, numbers were higher than usual in commercial apple orchards in the Hancock area of MARYLAND and populations in VIRGINIA were about as abundant as usual on neglected apple trees, with damage ranging from about 25 to 50 percent. A large second brood occurred west of the Blue Ridge Mountains and peach growers who treated properly suffered very little loss, but those who did not control the first brood had considerable trouble and injury during the second-brood period. This was especially true in some orchards at Piedmont, Virginia, where up to 25-30 percent of the fruit was lost. The greatest losses occurred in those orchards which had not been thoroughly treated or where some treatments were skipped.

Plum curculio adults emerged from hibernation around April 16 in DELAWARE and injury to young fruit of apple and peach was noted the second week of May. Egg punctures were moderate in a number of untreated apples in South Kingstown, RHODE ISLAND. In LOUISIANA, last-instar larvae of plum curculio were observed on plum in East Baton Rouge Parish near the end of April, and in May, serious damage to peaches was noted in Allen Parish. Infestations in TEXAS were medium and they caused little damage in OKLAHOMA. Plum curculio injury was light in treated orchards in KANSAS and some injury to apples occurred in MISSOURI where treatments were improperly timed. The weevil was first observed on cherries in Door County, WISCONSIN, on May 25 and egg laying occurred during the first week of July, with pupation taking place the first week of August. Commercial growers in MINNESOTA had some dissatisfaction with control with organic phosphates. Populations were generally light in Wisconsin and Minnesota, however, and normal in ILLINOIS.

SHOT-HOLE BORER (Scolytus rugulosus) caused average damage in UTAH; widespread with local damage to deciduous fruit trees in CALIFORNIA; and was prevalent in devitalized, weak or diseased trees in neglected peach orchards in GEORGIA.

CALIFORNIA PRIONUS (Prionus californicus) caused severe larval damage to some cherry tree roots in orchards in Davis County, UTAH; and FLATHEADED APPLE TREE BORER (Chrysobothris femorata) and PACIFIC FLATHEADED BORER (C. mali) caused heavy damage to many young apple and walnut trees in local areas of CALIFORNIA. DRIED-FRUIT BEETLE (Carpophilus hemipterus) caused concern in the fruit-growing areas of TEXAS. Local,heavy adult populations of a JUNE BEETLE (Cotinis texana) damaged deciduous fruit in San Bernardino, San Diego and Riverside Counties, CALIFORNIA. The beetle was also reported for the first time in Kern County during the year.

APHID infestations were generally not as prevalent and damaging as they were in 1959. Complaints were common in NEVADA and populations were abundant late in the season in CONNECTICUT. Hatching began on April 10 in NORTH CAROLINA. In ILLINOIS, egg populations were generally low and shortly after hatch no control problems were apparent. However, predaceous insects did not appear in the pink stage as they normally do in Illinois and aphids had a full generation to increase before predaceous insects appeared during the petal-fall stage. Aphids were generally widespread in CALIFORNIA and were present later in the season than normal. Fungus was present in some locations and partially controlled infestations.

APPLE APHID (Aphis pomi) was damaging in many localities in UTAH; reduced yields of apples in COLORADO; and was common in apple areas of MONTANA. Light populations occurred on apple in Tuolumne County, CALIFORNIA, and damaging numbers did not occur on apple until July and August in WASHINGTON. In many Washington orchards, no treatments were required. Apple aphid was normal for the year in ILLINOIS; much lighter than normal in MAINE; and well controlled in commercial orchards in MARYLAND. In DELAWARE, newly emerged nymphs were noted on April 1 in Kent County, and by April 15, many second-instar nymphs were noted on apples throughout the State. Populations remained low in treated orchards until mid-June when infestations became heavy on young trees and watersprouts.

ROSY APPLE APHID (Anuraphis roseus) was much less abundant in UTAH and medium to heavy on apples in Santa Cruz, Butte, Sonoma and Tuolumne Counties, CALIFORNIA. Yields in COLORADO were reduced and young trees were heavily attacked in DELAWARE in early July.First rosy apple aphid nymphs were noted April 15 in Kent County, Delaware. The pest was lighter than usual in MAINE, the Champlain Valley of NEW YORK and in MISSOURI. It was well controlled in commercial orchards in MARYLAND, but caused considerable damage in apples where original numbers were sufficient and controls were not applied in ILLINOIS.

APPLE GRAIN APHID (Rhopalosiphum fitchii) populations which had been quite high in MINNESOTA for several years during the prebloom period were not present; however, infestations of this aphid helped reduce yields of apples in COLORADO and another APHID (Anuraphis helichrysi) was damaging in many localities in UTAH. BLACK CHERRY APHID (Myzus cerasi) populations were medium on cherry in Santa Cruz County, CALIFORNIA, and about normal in MONTANA. WOOLLY APPLE APHID (Eriosoma lanigerum) was light to heavy on apple in Calaveras and Santa Cruz Counties, CALIFORNIA, and caused some damage to fruits in UTAH, NEW MEXICO and OKLAHOMA. Also, in CALIFORNIA, GREEN PEACH APHID (Myzus persicae) was widespread on deciduous fruit trees, but populations were generally kept under control by measures for other pests; and MEALY PLUM APHID (Hyalopterus pruni) populations were medium to heavy on prunes in Yolo, Tehama, Mendocino and Santa Clara Counties.

LEAFHOPPERS varied from moderately numerous to damaging in home orchards in UTAH and were generally heavy in CALIFORNIA on prunes in Santa Clara and Santa Cruz Counties. CATFACING INSECTS caused medium to heavy damage in TEXAS and normal damage in UTAH, but did not deform and gnarl peaches as badly as in 1959 in GEORGIA. TARNISHED PLANT BUG (Lygus lineolaris) infestations and injury were somewhat heavier than usual in York County, MAINE; but catfacing by this species was exceptionally low in ILLINOIS. PLANT BUGS were not numerous early in the season in CONNECTICUT and caused only minor injury to fruit in PENNSYLVANIA. STINK BUGS caused serious peach fruit deformation in some WASHINGTON orchards; and Euschistus conspersus and other stink bugs were light to heavy on deciduous fruit trees in the Sacramento and upper San Joaquin Valleys and northern coast counties of CALIFORNIA. Considerable fruit damage occurred in California which resulted in heavy cullage at harvest time. Also in California, BOXELDER BUG (Leptocoris trivittatus) caused light damage to pear flower buds in Mendocino County.

Weather conditions during the spring and early summer were ideal for development of PEAR PSYLLA (Psylla pyricola) in eastern WASHINGTON. Considerable damage to pears occurred where control measures failed or were not applied. Hot, dry weather during the first 2 weeks in July caused death of many pear psylla nymphs, especially the hard-shells, by crystalization of honeydew. Unusually low numbers of pear psylla occurred in southwestern Washington, however. In CALIFORNIA, moderate to heavy populations occurred on pears in many northern counties. San Luis Obispo County is the farthest south this pest is known to occur.

APPLE MEALYBUG (Phenacoccus aceris) was recorded in several counties in the Eastern States for the first time during 1960; Sullivan and Grafton Counties, NEW HAMPSHIRE; Bennington and Windham Counties, VERMONT; and Clinton County, NEW YORK. Populations in MAINE appear to have returned to their normal levels following the outbreak of 1957-1959.

SCALE INSECTS caused some damage to deciduous fruit trees in localized areas of the country; SAN JOSE SCALE (Aspidiotus perniciosus) appeared to be the most important. In CONNECTICUT, San Jose scale was reported increasing in experimental peach orchards and was again noticeable; however, the condition was not general in the State. Infestations in RHODE ISLAND were heavy locally on apple in East Greenwich; and a serious problem developed in some cherry orchards in the Hancock area of MARYLAND, with apples and plums being infested in all areas of the State. The San Jose scale infestation in GEORGIA was generally about the same as in 1959, which was less than that of 1958 or that of an average year. In TEXAS, infestations were rather heavy in isolated areas; and the pest was very abundant in some peach orchards in Lincoln Parish, LOUISIANA, in February. San Jose scale caused limited damage to fruit and nut crops in OKLAHOMA and infestations were generally light in KANSAS. In NEW MEXICO, the scale became extremely heavy in a number of orchards in Rio Arriba, Sandoval and Lincoln Counties; and it was occasionally damaging, but becoming a more serious problem, on small orchards in Utah, Salt Lake and Weber Counties, UTAH. In CALIFORNIA, light to heavy infestations occurred statewide on deciduous fruit trees. Heavier populations occurred in 1960 than in the past two years.

FORBES SCALE (Aspidiotus forbesi) was conspicuously absent in MISSOURI and generally light in KANSAS. EUROPEAN FRUIT LECANIUM (Lecanium corni) caused limited damage to fruit and nut crops in OKLAHOMA and was generally light on apricot and plum in CALIFORNIA, with some local medium infestations. OYSTERSHELL SCALE (Lepidosaphes ulmi) was damaging in MONTANA where no controls were applied and infested apple trees in Humboldt County, CALIFORNIA. TERRAPIN SCALE (Lecanium nigrofasciatum) infestations were reported on peaches in ILLINOIS and WHITE PEACH SCALE (Pseudaulacaspis pentagona) heavily infested a commercial peach orchard in Dooly County, GEORGIA. OLIVE SCALE (Parlatoria oleae) has become widespread in CALIFORNIA. Deciduous fruit trees and olives in the San Joaquin Valley had light to medium infestations during 1960. Other locations in the northern and southern areas of California had local infestations. Biological control is an important factor in control. Also in California, another SCALE INSECT (Aspidiotus howardi) was light on apricot in the Hemet area of Riverside County and BLACK SCALE (Saissetia oleae) was heavy on olives in San Joaquin County.

APPLE MAGGOT (Rhagoletis pomonella) continued to be a problem in several Eastern as well as in some Central States. In CONNECTICUT, apple maggot appeared somewhat later than normal and continued to be a problem much later in the season than usual. Adults were observed well into the third week of September in the State. Apple maggot was perhaps the number one fruit insect problem in Connecticut during 1960. The pest was also generally prevalent and serious in all but the best managed orchards in Belknap and Carroll Counties, NEW HAMPSHIRE; and injury by apple maggot was heavier than normal in most areas of MAINE. In the latter State, emergence began June 27 in Kennebec County, with the peak being reached July 18, and emergence was essentially completed by August 19. In RHODE ISLAND, adults delayed their appearance in apple plantings; bait traps produced 24 flies in an untreated orchard compared with one fly in a regularly treated area during a week's trapping period in August. Complaints from home orchards of larval damage in Rhode Island were virtually eliminated due to the heavy crop removal by Hurricane Donna on September 12. A very late apple maggot infestation was reported in one orchard in the Hudson Valley and a general decrease in population was observed in commercial orchards in the Champlain Valley of NEW YORK. In PENNSYLVANIA, apple maggot became quite severe in some orchards that received an incomplete spray schedule, with 90 percent of the fruit being infested in some cases.

Apple maggot infestations in apples and cherries in WISCONSIN were higher than normal by the end of the season, although populations appeared low. Populations were extremely high in MINNESOTA for the third consecutive year. The pest was by far the most destructive insect of neglected orchards and back-yard trees in Minnesota, although good control was achieved in commercial orchards with a complete spray schedule. Apple maggot also caused considerable damage in SOUTH DAKOTA where many small, home orchards had nearly 100 percent of the fruit infested; and severe infestations of the pest were reported in eastern NORTH DAKOTA. Adult emergence occurred during the first week of July in Minnesota and began July 12 in Kenosha County, Wisconsin.

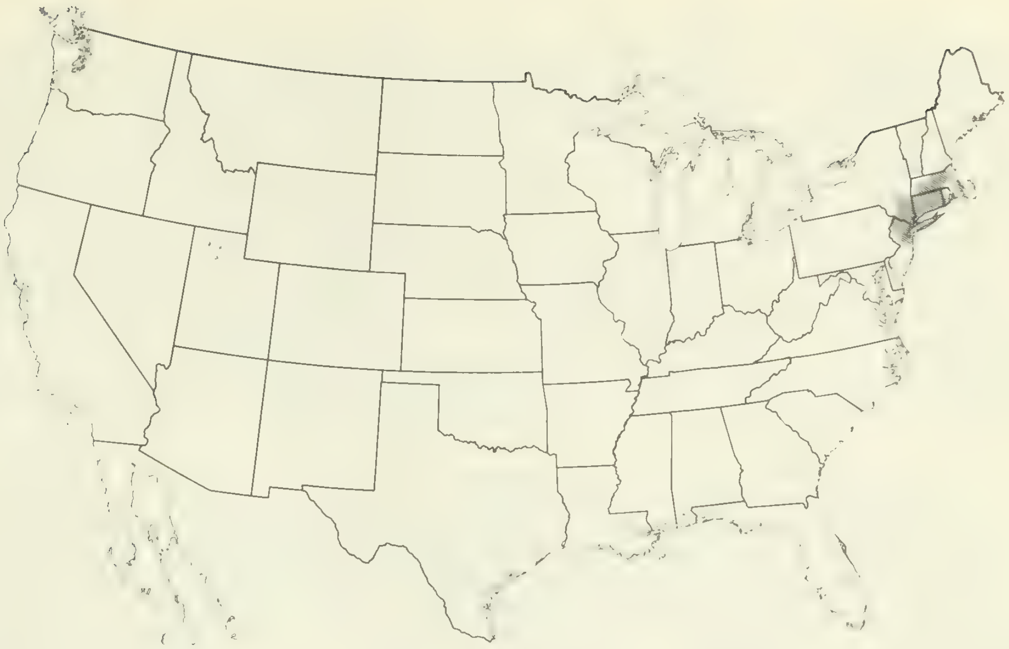
WESTERN CHERRY FRUIT FLY (Rhagoletis cingulata indifferens) populations increased in Ravalli, Missoula, Flathead and Lake Counties, MONTANA. Controls were effective in all areas of OREGON. First emergence was May 30 at The Dalles, May 24 in Jackson County and June 2 at Hood River. In WASHINGTON, the latest emergence of western cherry fruit fly in 12 years due to cool weather lessened control problems. Local infestations on cultivated cherries in the quarantine area in Humboldt and Siskiyou Counties, CALIFORNIA, occurred. This is an eradication pest. Several thousand Frick traps are annually placed in northern California to detect this pest.

Orange-red maggots of an unspecified GALL MIDGE again produced galls, ruining 95-99 percent of the chokecherry fruit in Logan, Smithfield, High Creek, Blacksmith Fork, Ogden, Provo, Bountiful, Parley's Canyons and elsewhere in northern UTAH.

PEAR-SLUG (Caliroa cerasi) caused average damage to cherry, pear and plum foliage in UTAH and complaints were common in NEVADA. It was also prevalent on cherry and pear in northern CALIFORNIA. Larvae were very abundant in mid-June on pear trees in northern Kent County, DELAWARE. CALIFORNIA PEAR-SLUG (Pristiphora californica) was common in untreated pear trees in the Medford area of OREGON during May.

VINEGAR FLIES were quite abundant on cracked fruit and around packing houses in PENNSYLVANIA, although not as severe as in 1959. In CALIFORNIA, Drosophila spp. caused severe damage to ripening deciduous fruits, figs and grapes. They were also a problem in processing plants. Investigations of the problem were carried out by cooperating agencies.

EUROPEAN APPLE SAWFLY (Hoplocampa testudinea) was much more noticeable than usual in the Hudson Valley of NEW YORK and increased slightly, but not to alarming proportions, in CONNECTICUT. The insect was reported in Plymouth County, MASSACHUSETTS, for the first time and further spread in Middlesex, Worcester, Hampshire and Hampden Counties was reported. (See map on following page.)



Distribution of European Apple Sawfly

THRIPS in general were plentiful and well distributed over CALIFORNIA. Practically all fruit crops were affected. Nectarines were damaged during the blossom stage. PEAR THRIPS (Taeniothrips inconsequens) caused early damage to prune and pear in Santa Clara and Mendocino Counties.

MITES in general were a considerable problem in CALIFORNIA. Citrus and walnuts developed early populations in Imperial and Tulare Counties. From June on, most areas experienced varying populations on deciduous fruits and walnuts. From August through October heavy populations were general.

EUROPEAN RED MITE (Panonychus ulmi) was generally not as important as it was during the 1959 season. Several late-season infestations were damaging, however, and presented some control problems in several Eastern States. In MAINE, infestations of European red mite were generally light to moderate throughout the State until early August when a sudden buildup took place in numerous orchards; injury was moderate to severe in some plantings. Populations in well treated orchards remained light. European red mite was not abundant early in CONNECTICUT, but increased to the usual levels late in the season. Mites and eggs were abundant in some apple plantings in early August in RHODE ISLAND and growers experienced difficulty in their control with some miticides. In NEW YORK, a general control problem developed in the Champlain Valley. Populations in MARYLAND were below normal in apple and peach orchards, particularly late in the season, but did begin a general buildup in DELAWARE in mid-July. Overwintering eggs began hatching in the latter State the last week of April and in western NORTH CAROLINA on April 10. By April 18, in North Carolina, most mites had passed through the first molt, and by early May, European red mite was a problem in all orchards in the area that were not treated with a dormant oil. Miticides were necessary at that time.

European red mite infestations were light to moderate on apples in GEORGIA, light in KANSAS and below normal in UTAH. The overwintering populations were variable in ILLINOIS, but generally lower than the previous 2 years. Stronger control measures were applied and fewer cases of damage occurred in the State. European red mite was present in varying numbers in apple orchards in MISSOURI, but in general, controlled by a single early season treatment. In mid-July, heavy infestations bronzed foliage of peach trees in southeast Missouri, however. In WISCONSIN, eggs of European red mite began hatching in Door County by May 15 and the first summer eggs were laid June 7. Populations increased slowly, and by mid-August had built up in some orchards. A light infestation was reported attacking apple at Fargo, NORTH DAKOTA; the first ARS record of this species in the State. Infestations of European red mite in WASHINGTON were generally more serious on pears than for the past few years. The resistance to specific miticides is increasing in Washington. In CALIFORNIA, light to heavy local populations of European red mite occurred on walnuts and deciduous fruits from April through December in most fruit-growing areas of the State.

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) caused the greatest amount of loss to apples in COLORADO and caused losses in pear orchards in that State. The pest was common and damaged fruit trees statewide in MONTANA, and was prevalent and difficult to control in some cases during the drought period in MISSOURI. Populations were generally light in KANSAS, but some buildup occurred in the south central area late in the season on peaches, with some leaf drop occurring. Infestations were light to moderate on apples in GEORGIA, continued low for the third successive year in VERMONT, and were at normal levels late in the season in CONNECTICUT.

Two-spotted spider mite populations were light to medium, with an occasional heavy local infestation on deciduous fruits, walnuts and almonds in CALIFORNIA. Populations developed rapidly in midsummer. In OREGON, first-brood eggs began to hatch in Jackson County, March 19, unusually early; adults were noted by April 30. In Hood River, nymphs appeared April 7. Some resistance to phosphate insecticides continues in Oregon. Two-spotted spider mite was occasionally found on pear and peach in WASHINGTON, but not on apple or cherry (except where interplanted with other fruits) in the Yakima Valley. The pest is restricted to pear and stone fruits other than cherry, from Wenatchee north in Washington, except near the Canadian border where it occurs on apple. Two-spotted spider mite also caused severe damage to peaches during the late season in some areas of the State.

Two-spotted spider mite and/or T. schoeni were first noted in DELAWARE the last week of April, but did not build up in orchards over the State until mid-June, and by late July or early August they outnumbered European red mite 2 to 1. This is the first time this situation has been observed during the past 5 years in Delaware.

A SPIDER MITE (Tetranychus mcdanieli) was highly injurious in many apple and sour cherry orchards in Weber, Salt Lake and Box Elder Counties, UTAH; and a survey showed that this mite was the predominant species of Tetranychus on all tree fruits except peaches in the Yakima Valley of WASHINGTON. It was also found on apple and cherry orchards from Wenatchee north in the latter State. High populations were found in apple tree tops as early as April in the Wenatchee area; the second year of such early development. Although no unusual difficulty was experienced in Washington, all apple growers had to apply one or more sprays for this pest during the season in the Yakima Valley.

Tetranychus spp. caused serious damage to foliage of fruit trees in NEW MEXICO because many growers failed to treat when a late spring frost caused a lack of fruit.

SPOTTED MITES suffered unusually high mortality in ILLINOIS and, although higher numbers had gone into hibernation, surviving mites were more difficult to find in the early spring. With the more severe control measures applied in Illinois, general damage did not appear later in the season than in previous years. This situation occurred in mid-August and the mites were nearly all FOUR-SPOTTED SPIDER MITE (Tetranychus canadensis). They began going into hibernation in late August, but 2 weeks of hot weather then allowed a rapid increase in populations and resulted in more damage than previously occurred throughout the season. A FRUIT TREE MITE (Bryobia rubrioculus) built up to the point where foliage in Taos, Rio Arriba, Sandoval, Bernalillo and Valencia Counties, NEW MEXICO, was severely damaged because of the lack of effective control programs. The mite was particularly severe on almonds and deciduous fruits in CALIFORNIA from February through August, but it was below average in numbers during 1960 in UTAH. PEAR LEAF BLISTER MITE (Eriophyes pyri) and Eriophyes sp. were normally damaging in some areas of UTAH, and pear leaf blister mite heavily infested orchard trees that were not treated in western MONTANA. E. pyri also heavily infested a nursery planting of several hundred pear trees at Sherwood, OREGON, with 100 percent of the leaves showing injury. The peach mosaic vector mite, Eriophyes insidiosus, extended into Ventura County, CALIFORNIA, being found at 2 locations.

PLUM RUST MITE (Aculus fockeui) appeared in large numbers on Washington County, OREGON, prune trees in June; and this species and Diptacus gigantorhychus heavily infested cherry plantings in MONTANA. Plum rust mite heavily infested and damaged foliage of a prune orchard in Rio Arriba County, NEW MEXICO, and moderate to severe damage by this pest occurred on cherries in the Wenatchee area of WASHINGTON during the fall. In addition, PEACH SILVER MITE (Aculus cornutus) also caused moderate to severe damage to peaches in the Wenatchee area of Washington during the same period.

An OLIVE LEAF MITE (Oxypleurites maxwelli) caused serious flower drop in the Corning-Red Bluff area of Tehama County, CALIFORNIA.

ORCHARD MITES of unspecified species were generally light in commercial orchards in MINNESOTA, caused late damage in peach and apple orchards throughout UTAH and were present, but not heavy, on apples in ARKANSAS. In MICHIGAN, comparatively warm, late summer weather brought on discontinuous outbreaks of mites on apples; and complaints of mites in NEVADA were common. In PENNSYLVANIA, mites had to be watched, but were held under control.

Pests of Avocado: Several pests caused damage to avocado in CALIFORNIA during 1960. AVOCADO BROWN MITE (Oligonychus punicae) populations began in July and continued through December. Populations were generally light in San Diego and Santa Barbara Counties. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) caused light leaf scarring and GREENHOUSE THRIPS (Heliothrips haemorrhoidalis) caused light fruit scarring on coastal avocados in San Diego County. General infestations of a SCALE INSECT (Aspidiotus lataniae) were present on avocados in Orange and San Diego Counties, but they were fairly well controlled by parasites and predators. Some damage by OMNIVOROUS LOOPER (Sabulodes caberata) occurred on avocados in San Diego County.

Nut Tree Insects: FALL WEBWORM (Hyphantria cunea) was one of the major pests of nut trees in 1960, causing considerable defoliation in several states. The infestation in NORTH CAROLINA was the worst experienced in 6 years in Stanly County and the Piedmont. Infestations on pecans in LOUISIANA appeared to be heavier than in the past several years over the State, with nests ranging as high as 12 per tree in some areas. In OKLAHOMA, fall webworm caused moderate to heavy defoliation to a number of trees (pecan, hickory, persimmon, etc.) throughout the eastern two-thirds of the State during July, August and September. The outbreak in Oklahoma was more widespread and heavier than those reported during the past several years. The first fall webworm colony of larvae observed feeding on pecan foliage in FLORIDA during 1960 was at Monticello, Jefferson County, on May 4. Larvae appeared on pecan trees at Fort Valley, GEORGIA, on June 27. The general infestation in Georgia was no heavier than that of 1959, which was lighter than that of 1958. It was, perhaps, somewhat lighter than that of an average year. Commercial filbert and walnut orchards were, in some cases, partially defoliated in OREGON.

WALNUT CATERPILLAR (*Datana integerrima*) infestations were very light on isolated pecan trees in TEXAS, caused only limited damage to nut crops in OKLAHOMA and were light and local in the southeastern part of GEORGIA; however, a buildup did occur in the coastal area of TEXAS in the early fall, and the pest defoliated walnut trees in northern INDIANA in late August and heavily infested pecans throughout LOUISIANA.

NAVEL ORANGEWORM (*Paramyelois transitella*) is one of the most serious pests of almonds and walnuts in CALIFORNIA. It caused heavy damage in the field and was a major cost in processing plants for control. All nut-growing areas of California, as well as some citrus areas, were affected in 1960.

RED-HUMPED CATERPILLAR (*Schizura concinna*)populations were variable in CALIFORNIA, but they damaged or defoliated walnuts, prunes and almonds from San Joaquin County northward.

PECAN NUT CASEBEARER (*Acrobasis caryae*) caused heavy losses of the pecan crop in TEXAS and infested pecans, generally, in LOUISIANA during June, with the heaviest infestations noted in the Lake Charles area. Infestations in OKLAHOMA were somewhat higher in most areas of the State than those of 1959, with counts ranging 10-30 percent of nut clusters infested common in untreated groves in the south central and central areas during June, July and August. In NEW MEXICO, damage to nuts by pecan nut casebearer was much less severe than that of 1959 in the Carlsbad area. Many individuals had their pecan trees treated at intervals throughout the season, attempting to control this pest, but only partial control was obtained. The infestation in FLORIDA was heavy on untreated pecan trees in Jefferson County, with counts averaging 2-3 larvae per twig on 50 twigs checked. All larvae were active and feeding on buds on March 31; 50 percent in pupal stage on April 28; and first eggs collected on May 4. In GEORGIA, pecan nut casebearer infestations were light to moderate throughout the pecan-growing area.

PECAN LEAF CASEBEARER (*Acrobasis juglandis*) larvae were active and feeding on buds on March 31 in FLORIDA. By April 28, infestations in some pecan orchards were the heaviest in several seasons. Defoliation of pecan trees in southeastern GEORGIA was light to moderate.

PECAN CIGAR CASEBEARER (*Coleophora caryaefoliella*) is becoming more prevalent each year at Monticello, Jefferson County, FLORIDA. Light larval infestations were observed feeding on pecan. CIGAR CASEBEARER (*C. serratella*) infestations were light to moderate on pecans in GEORGIA.

PECAN BUD MOTH (*Gretchena bolliana*) caused severe injury to pecans in NORTH CAROLINA because plants were apparently growing from under insecticide applications. Young larvae of pecan bud moth were found feeding on young nuts in Jefferson County, FLORIDA, in May, the damage being very similar to first-generation pecan nut casebearer.

HICKORY SHUCKWORM (*Laspeyresia caryana*) caused some economic damage to pecans in TEXAS and infested pecans in Washington County, NORTH CAROLINA. Populations were lower than in 1959 in OKLAHOMA. In FLORIDA, moths emerged in laboratory cages at Monticello on March 14 as compared with February 24 in 1959. Moth emergence was still slow due to cool weather on March 31 in Florida. PECAN CARPENTERWORM (*Cossula magnifica*) damaged trunks of large pecan trees at Fort Valley, GEORGIA.

A LEAF ROLLER (Archips rosana) injured leaves of filberts throughout the Willamette Valley of OREGON, with some orchards having over 50 percent of leaves curled. Adults first appeared in Marion County on April 6 and were numerous in mid-June. Infestations of filberts by FILBERTWORM (Melissopus latiferreanus) in OREGON were variable; correct timing and adequate application of insecticides gave excellent results. Filbertworm adults emerged July 6 in Willamette Valley. Trials with several cages, bait and light devices, to more accurately judge adult emergence, indicate that blacklight is a most promising method. In CALIFORNIA, filbertworm populations were heavy in walnuts in the Gridley area of Butte County.

PECAN PHYLLOXERA (Phylloxera devastatrix) infestations were very heavy throughout the pecan-growing area of TEXAS, and Phylloxera spp. were common on pecans throughout most of OKLAHOMA during the late spring and early summer. These pests caused considerable concern to pecan growers in many sections of Oklahoma, particularly to people with only a few trees. The populations were somewhat higher than those reported during the past few years.

BLACK PECAN APHID (Melanocallis caryaefoliae) infestations were light to heavy, and damaged pecan foliage in Dona Ana, Eddy and Chaves Counties, NEW MEXICO, and were much more common on pecan trees than during the previous 2 years in OKLAHOMA. Medium populations (2-3 per leaflet) caused some defoliation in south central Oklahoma during late July and August. One pecan grove was heavily infested in Caddo Parish, LOUISIANA, during September. BLACK-MARGINED APHID (Monellia costalis) was very heavy on pecan trees over ARIZONA during September, October and November; and light to heavy infestations of this aphid damaged pecan foliage in Dona Ana, Eddy and Chaves Counties, NEW MEXICO. In OKLAHOMA, black-margined aphid was common on pecan and hickory, with the heaviest populations building up during the late summer. Reports of heavy infestations covering pecan leaves with honeydew were common in many parts of Oklahoma. An APHID (M. caryella) was light on foliage of Mahan pecans in Jefferson County, FLORIDA, in April; and another APHID (Myzocallis coryli) dropped to a low level in filberts in OREGON from those experienced in 1959. No controls were necessary for M. coryli in most filbert orchards in Oregon during 1960; economic levels did not build up until August. Light to heavy populations of WALNUT APHID (Chromaphis juglandicola) were widespread on walnuts throughout CALIFORNIA during 1960. In UTAH, unspecified APHIDS severely infested pecans in Washington County and black walnuts in some Utah, Salt Lake, Weber, Davis, Cache and Box Elder County localities in the spring. Aphids were unusually moderate elsewhere on nut trees in Utah. Aphid infestations on English walnut foliage were light in Salt Lake, Weber, Davis, Utah and Washington Counties. In GEORGIA, an unspecified aphid was found feeding on female flowers of pecan trees and was responsible for the reduction of the potential nut crop in several counties.

APPLE MEALYBUG (Phenacoccus aceris) appeared to be less of a problem in OREGON filberts in the area of original infestation near Gervais, Marion County; but the pest has now been found in Linn, Benton and Lane Counties, Oregon, and is a potential threat to filbert growing. A light infestation of a SPITTLEBUG (Clastoptera achatina) was observed on pecans at Monticello, Jefferson County, FLORIDA, in April; and an unspecified MIRID was found feeding on female flowers of pecan trees and was responsible for the reduction of the potential nut crop in several GEORGIA counties. In CALIFORNIA, OYSTERSHELL SCALE (Lepidosaphes ulmi) damaging young black walnut trees in a few mountain areas, and infestations of another SCALE INSECT (Lecanium pruinosum) on walnut, were controlled by parasites. Also in California, local, heavy populations of a LEAF-FOOTED BUG (Leptoglossus sp.) occurred in the Durham area of Butte County on almond fruit.

PECAN WEEVIL (Curculio caryae) began showing up in the south cental area of OKLAHOMA during the first week of August, and by early September was common in all pecan-producing areas of the State. Infestations were about equal to, or slightly higher than, those noted in 1959 in Oklahoma. Also, TWIG GIRDLER (Oncideres cingulata) caused heavy damage to pecan and other trees during the late summer and fall in OKLAHOMA. Infestations and damage were somewhat greater than those reported during the past several years. MAY BEETLES (Phyllophaga spp.) caused light to moderate defoliation of pecan trees in GEORGIA during 1960. EUROPEAN EARWIG (Forficula auricularia) damaged some young buds of deciduous trees and some walnut husks at harvest time in northern CALIFORNIA. Also in California, PEACH TWIG BORER (Anarsia lineatella) was a considerable problem in almond fruit.

WALNUT HUSK FLY (Rhagoletis completa) has spread and become generally damaging throughout Weber and Davis Counties and has also commonly infested walnuts in Utah and Salt Lake Counties, UTAH. The spring frost reduced the 1960 set of nuts in Utah and little maggot injury was evident. Trapping results in OREGON were negative during 1960. In CALIFORNIA, light to medium infestations were present in walnuts. The pest is slowly extending its range within California. Peach fruit in San Bernardino, Riverside and San Diego Counties was also attacked.

Infestations of a FALSE SPIDER MITE (Brevipalpus sp.) were moderately heavy and spotty and caused minor damage to pecan foliage in Dona Ana County, NEW MEXICO. This is the first record of this mite being identified from pecan in New Mexico. PACIFIC MITE (Tetranychus pacificus) populations were light to medium on walnuts in Los Angeles County, CALIFORNIA.

Pests of Citrus: CITRUS RUST MITE (Phyllocoptruta oleivora) was active throughout the year in CALIFORNIA. Varying populations occurred on citrus in San Diego, Orange and Santa Barbara Counties. In FLORIDA, populations of citrus rust mite were lower than usual early in January; then, contrary to the usual trend, increased to the highest February level on record and remained above average through March. They were average during April, May and June, but caused little trouble until the June increase began. Populations were below average in July and August, and slightly above average in September. Some citrus groves developed heavy, late summer infestations and the mite became the most troublesome citrus pest in Florida during the period October through December. It increased rapidly in November in all areas and reached a near-record peak at mid-December, then slowly declined. Economic infestations of citrus rust mite were present in nearly all citrus groves in Florida at some time during the last 3 months.

CITRUS RED MITE (Panonychus citri) populations began the year in FLORIDA below average and remained unusually low until May, then increased to a moderately high peak in late June. They were in average abundance during July and August in that State. The summer decline in Florida continued into September, and by the end of that month the population was the lowest in 9 years of record. Citrus red mite was at a record low level in October and remained below average throughout December. In CALIFORNIA, citrus red mite has been more of a problem to control than in former years, and has extended its range into the citrus areas of the San Joaquin Valley. It also occurred in the northern area of the State occasionally. All citrus-growing areas in California, from Tulare County southward, experienced general populations, with many local, heavy infestations. The mite was active throughout the year in California.

TEXAS CITRUS MITE (Eutetranychus banksi) populations were moderate in abundance in 20 percent of the FLORIDA citrus groves from January through March; more abundant and in more groves, 44 percent, by the end of June than in any previous year; reached a record high in July when 52 percent of the citrus groves were infested, 10 percent heavy; and remained present for the duration of the year (33 percent of the groves infested from October through December) although only a few infestations during the latter period were of a serious nature.

SIX-SPOTTED MITE (*Eotetranychus sexmaculatus*) became abundant in a few *FLORIDA* citrus groves that continuously harbor this pest during the period January through March, but populations were generally average at the end of March. The mite peaked at average level in early June in Florida. In *CALIFORNIA*, YUMA SPIDER MITE (*E. yumensis*) populations were light on citrus in the Coachella Valley, Riverside County, and CITRUS FLAT MITE (*Brevipalpus lewisi*) was light on citrus in San Bernardino and Tulare Counties from March through December. Yuma spider mite and citrus flat mite were also of localized importance in Yuma County, *ARIZONA*, during 1960.

CITRUS BUD MITE (*Aceria sheldoni*) was found on lemon an Indrio, St. Lucie County, and South Miami, Dade County, *FLORIDA*, in June. These are the only two known infestations in Florida, but it is likely that the mite can be found along the coast of the State in other citrus-growing areas.

FLORIDA RED SCALE (*Chrysomphalus aonidum*) was slightly below average in abundance in January in *FLORIDA* and dropped to far below average in February and March. It remained in the low range until early July, when it increased rapidly from below average to a peak in early August that was near the 9-year record. Although populations of Florida red scale dropped greatly in September, it still was above average abundance and remained so until the end of the year in Florida.

CALIFORNIA RED SCALE (*Aonidiella aurantii*) infestations were light to medium in all citrus-growing areas in southern *CALIFORNIA*, and infestations occurred locally in Kern, Tulare, Yolo, Glenn, Butte and Yuba Counties. Parasites have materially reduced many populations in California.

PURPLE SCALE (*Lepidosaphes beckii*) populations in *FLORIDA* were at a very low level early in the year when only 75 percent of the citrus groves were infested compared with the usual over 90 percent. Infestations generally remained light for the rest of the year except for temporary increases of less than 10 percent during the period July to September. In *CALIFORNIA*, light infestations of this scale insect were present on citrus in Orange County and it also occurred on dooryard citrus in a limited area in Santa Barbara County.

BLACK SCALE (*Saissetia oleae*) is a general problem in all southern and coastal citrus-growing areas of *CALIFORNIA* and requires considerable control. Parasites and predators were active, but not sufficiently so to control this pest during 1960. This scale is widespread in California. In *FLORIDA*, black scale declined from a low to a very low status during the period January through March in citrus. Infestations increased to above-average level in July, but were of little concern.

YELLOW SCALE (*Aonidiella citrina*) infestations in *CALIFORNIA* were light to medium on citrus in Tulare County; and spotted infestations on dooryard and street trees occurred in Sacramento and Contra Costa Counties during 1960. In *FLORIDA*, yellow scale was more abundant than usual in citrus groves throughout the season, but was of little importance. CHAFF SCALE (*Parlatoria pergandii*) was present in nearly twice as many citrus groves, 72 percent, as in the preceding 9 years of record throughout the year; however, only light damage resulted. FERN SCALE (*Pinnaspis aspidistrae*) and GLOVER SCALE (*Lepidosaphes gloverii*) were also more abundant than usual throughout the year in Florida citrus, but were of little importance. In *ARIZONA*, COTTONY-CUSHION SCALE (*Icerya purchasi*) was of localized importance on citrus in Yuma County and CITRICOLA SCALE (*Coccus pseudomagnoliarum*) was of local importance in Maricopa County.

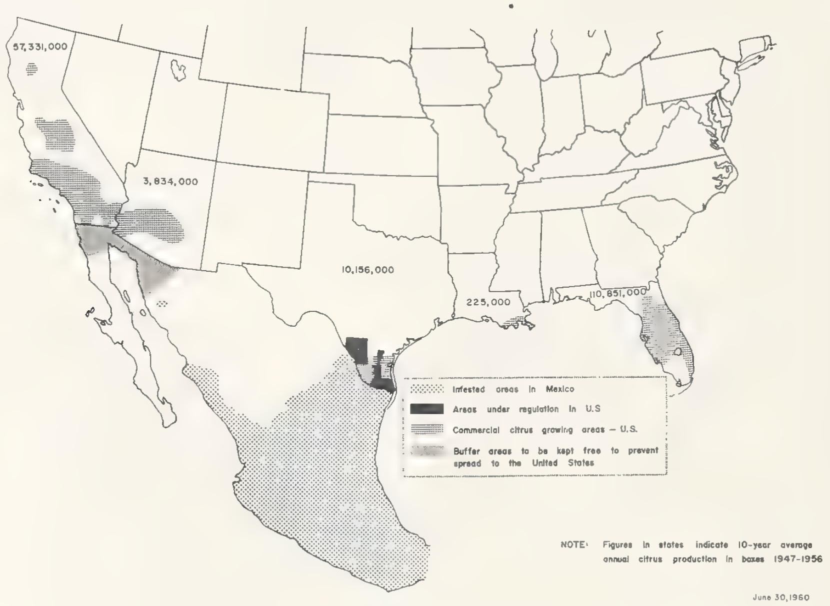
MEALYBUGS in general were present on citrus in Riverside and Santa Barbara Counties, *CALIFORNIA*. A general infestation of CITRUS MEALYBUG (*Planococcus citri*) was present on coastal citrus from Santa Barbara to San Diego Counties. Ant control and predators helped in the reduction of populations. ARGENTINE ANT (*Iridomyrmex humilis*) was said to be responsible for the spread of aphids, scale and mealybugs on citrus and interfered in biological control of the aforementioned pests. GREEN PEACH APHID (*Myzus persicae*) was widespread on citrus in California, but was generally kept under control by control measures for other pests.

APHIDS increased to abnormally high levels in late March in FLORIDA and built up in April to the highest in 9 years of record; but WHITEFLIES were less numerous than usual in Florida citrus from October through December, when they are normally prevalent. CITRUS WHITEFLY (Dialeurodes citri) heavily infested groves of satsumas in East Baton Rouge, Tangipahoa and Plaquemines Parishes, LOUISIANA.

CITRUS THRIPS (Scirtothrips citri) infestations in ARIZONA citrus were considerably later than in 1959, but became heavy by mid-April. Control measures were successful in both the Yuma and Maricopa County areas, but in some untreated groves considerable damage occurred both to new foliage and small fruit. In CALIFORNIA, light to medium populations of citrus thrips occurred in Ventura, Tulare, San Bernardino, Riverside and San Diego Counties.

Several other pests were reported on citrus in CALIFORNIA. KATYDIDS caused light damage to citrus limbs and twigs in the Arlington-Corona area of Riverside County, and LEAFHOPPERS were light on citrus in Tulare County. CLIMBING CUTWORMS caused light to medium damage to citrus in the Highlands area of Riverside County, and FRUIT-TREE LEAF ROLLER (Archips argyrospilus) was medium on citrus in Riverside County. ORANGE TORTRIX (Argyrotaenia citrana) was light to medium and PINK SCAVENGERWORM (Pyroderces rileyi) trace to medium in oranges in Orange County. WESTERN TUSSOCK MOTH (Hemerocampa vetusta) also damaged oranges in Orange County; and a TORTRIX (Clepsis peritana) was very light on citrus in Tulare and Riverside Counties. BROWN GARDEN SNAIL (Helix aspersa) was a general pest of citrus in the coastal counties from Santa Barbara County southward. The pest is usually controlled by baits or ducks.

A PEEL MINER (Marmara sp.) was of localized importance on citrus during 1960 in ARIZONA.


57,331,000
3,834,000
10,156,000
225,000
110,851,000
Infested areas in Mexico
Areas under regulation in U.S
Commercial citrus growing areas — U.S.
Buffer areas to be kept free to prevent spread to the United States
NOTE: Figures in states indicate 10-year average annual citrus production in boxes 1947-1956
June 30,1960

Status of Mexican Fruit Fly

MEXICAN FRUIT FLY (Anastrepha ludens) poses a threat each year to the citrus of ARIZONA, CALIFORNIA and TEXAS. It has been kept out of the western citrus belt and kept from spreading from incipient infestations in Texas to other states through regulatory action. The infestation in the Republic of Mexico will always constitute a reservoir of infestation that might spread to the United States. However, it is believed that cooperation between the Mexican Defensa Agricola and the citrus states on the Mexican border will prevent the establishment of the fruit fly in the United States. Trapping operations during the year 1960 in the United States were negative, except for the catches made in the lower Rio Grande Valley of Texas where the pest is trapped annually.

Pests of Grape: WESTERN GRAPE LEAF SKELETONIZER (Harrisina brillians) was confined, in CALIFORNIA, to local areas in San Diego County. It occurred for the first time in cultivated grapes in Escondido, San Diego County, during 1960. In ARIZONA, heavy infestations damaged grape foliage in homeyard plantings statewide throughout the summer. The insect was not a problem in commercial Arizona vineyards in 1960, but it did seriously damage grape foliage in the Mesilla Valley of NEW MEXICO during September. Western grape leaf skeletonizer was almost completely controlled in Washington County, UTAH, again by parasites and predators. Surveys in NEVADA indicate that this pest is currently confined to one section of Las Vegas, Clark County. GRAPE LEAF SKELETONIZER (H. americana) infestations were reported on grapes in Taylor County, GEORGIA, in 1960.

GRAPE BERRY MOTH (Paralobesia viteana) populations were about the same as in 1959 in ARKANSAS, with a moth buildup occurring late in the season. The pest was damaging again to grapes in a few Washington County, UTAH, vineyards. Three broods appeared in MISSOURI; the second causing some injury in some vineyards before control was obtained.

GRAPE ROOT BORER (Vitacea polistiformis) was found heavily attacking grape roots in a vineyard in Sussex County, DELAWARE. In the most severe area, almost no growth was evident this past season. Grape root borer caused severe damage on several acres of grapes in MISSOURI. To all intents and purposes, this is a new pest of grapes in Missouri and no adequate control measures have yet been worked out. RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) was a problem, and special sprays were needed to effect control in the grape-growing area of Erie County, PENNSYLVANIA. In CALIFORNIA, CLIMBING CUTWORMS caused light to medium damage to grapes in the St. Helena area of Napa County.

MEALYBUGS in general were present on grapes in Tulare County, CALIFORNIA, and GRAPE MEALYBUG (Pseudococcus maritimus) was light on grapes in Kern County. In OREGON, an infestation in one 6-acre pear block and adjoining oak and mistletoe, was carefully sprayed in late summer. Populations of grape mealybug appeared greatly reduced, with some egg deposition in early August in Oregon. An unusually heavy infestation of grape mealybug was present on grapes in the lower Yakima Valley of WASHINGTON during midsummer. Low numbers were present in nearly all MISSOURI vineyards in mid-July, but in most instances adequate control was obtained before much injury resulted. Populations of grape mealybug were about the same as in 1959 in ARKANSAS.

GRAPE PHYLLOXERA (Phylloxera vitifoliae) was severe on grapes in Livermore, Alameda County, CALIFORNIA; GRAPEVINE APHID (Aphis illinoisensis) was heavy on grape locally in West Warwick, RHODE ISLAND, in early July; and a SPITTLEBUG (Clastoptera lawsoni) heavily infested backyard grapevines at Truth or Consequences, NEW MEXICO, during August.

LEAFHOPPERS in general were light on grapes in Riverside County, CALIFORNIA; but Erythroneura sp. infestations were heavy and damaged grape foliage in Dona Ana, Sierra, Bernalillo and Rio Arriba Counties, NEW MEXICO. Erythroneura sp. was light in grape-growing areas of ARIZONA in late March and continued a problem throughout the spring.

JAPANESE BEETLE (Popillia japonica) adults attacked grape foliage in mid-June in DELAWARE and continued to be present through August. DARKLING BEETLES were a problem during early spring in ARIZONA, feeding on grape buds. A COCKCHAFER (Hoplia sp.) was locally heavy on grapevines in San Joaquin County, CALIFORNIA, during 1960; and a GRAPE BUD BEETLE (Glyptoscelis squamulata) was very light in grapes in the Coachella Valley, Riverside County, California.

GRAPE ERINEUM MITE (Eriophyes vitis) populations were light to medium on grapes in Stanislaus, Sacramento and Mendocino Counties, CALIFORNIA; and PACIFIC MITE (Tetranychus pacificus) populations were light to medium on grapes in Kern County, California.

Pests of Currants and Cranberries: Several species of CURRANT APHIDS were generally moderate in UTAH, with at least normal injury to red currant foliage by CURRANT APHID (Capitophorus ribis). Also in Utah, CURRANT FRUIT FLY (Epochra canadensis) caused its general infestation in black and yellow currants. BLACK-HEADED FIREWORM (Rhopobota naevana) continues to cause scattered damage to cranberry plantings in Clatsop and Coos Counties, OREGON; control programs appear to be used haphazardly. A SPIDER MITE (Tetranychus mcdanieli) damaged red currant foliage in several UTAH counties during 1960.

Pests of Blueberry: BLUEBERRY MAGGOT (Rhagoletis pomonella) was serious in some areas of NEW HAMPSHIRE in low-bush blueberries, due in part to the generally light crop, and the pest severely attacked blueberries for over 3 weeks in Putney, VERMONT. In MAINE, blueberries showed the heaviest injury in over a 7-10-year period; the amount of blueberries rejected at canning plants by state inspectors was above the usual level. BLUEBERRY THRIPS (Frankliniella vaccinii) showed an increase in Washington County, MAINE; infestations in other areas of the State were generally equal to, or below, the normal level. CHAIN-SPOTTED GEOMETER (Cingilia catenaria) occurred in unusual outbreak proportions in Merrimack County, NEW HAMPSHIRE, where it completely defoliated 50-60 acres of low-bush blueberry. CHERRY FRUITWORM (Grapholitha packardi) and CRANBERRY FRUITWORM (Acrobasis vaccinii) larvae were identified from cultivated blueberries from the southeastern area of NORTH CAROLINA during 1960. RED-HUMPED CATERPILLAR (Schizura concinna) severely defoliated a new blueberry planting in North Kingston, RHODE ISLAND, in late July; and BLUEBERRY BUD MITE (Aceria vaccinii) caused an estimated 20-percent loss of the blueberry crop in NORTH CAROLINA in 1960, approximating 400,000 dollars.

UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON 25, D. C.

Official Business

POSTAGE AND FEES PAID

U. S. Dept. of Agr. Library
Beltsville Branch
7-16-58 Plant Industry Station
IPS Beltsville, Md.